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ABSTRACT

This report provides comprehensive statistical information on the size and scope of federal funding for research and development (R&D) and the types of institutions and purposes to which such funds are directed. The report covers fiscal years 1973, 1974, and 1975. Some of the highlights of the report include: (1) a 20 percent increase in energy activity paces industrial R&D spending in 1973; (2) federal R&D funding for fiscal year 1975 continues to decline as a share of the total budget; (3) state agency R&D activities almost quadrupled from fiscal year 1964 to fiscal year 1973; (4) R&D expenditures of independent nonprofit institutions approach one billion dollars in 1973; and (5) federal funding in higher education: Academic Science shows decline in fiscal year 1973. (Author/EB)

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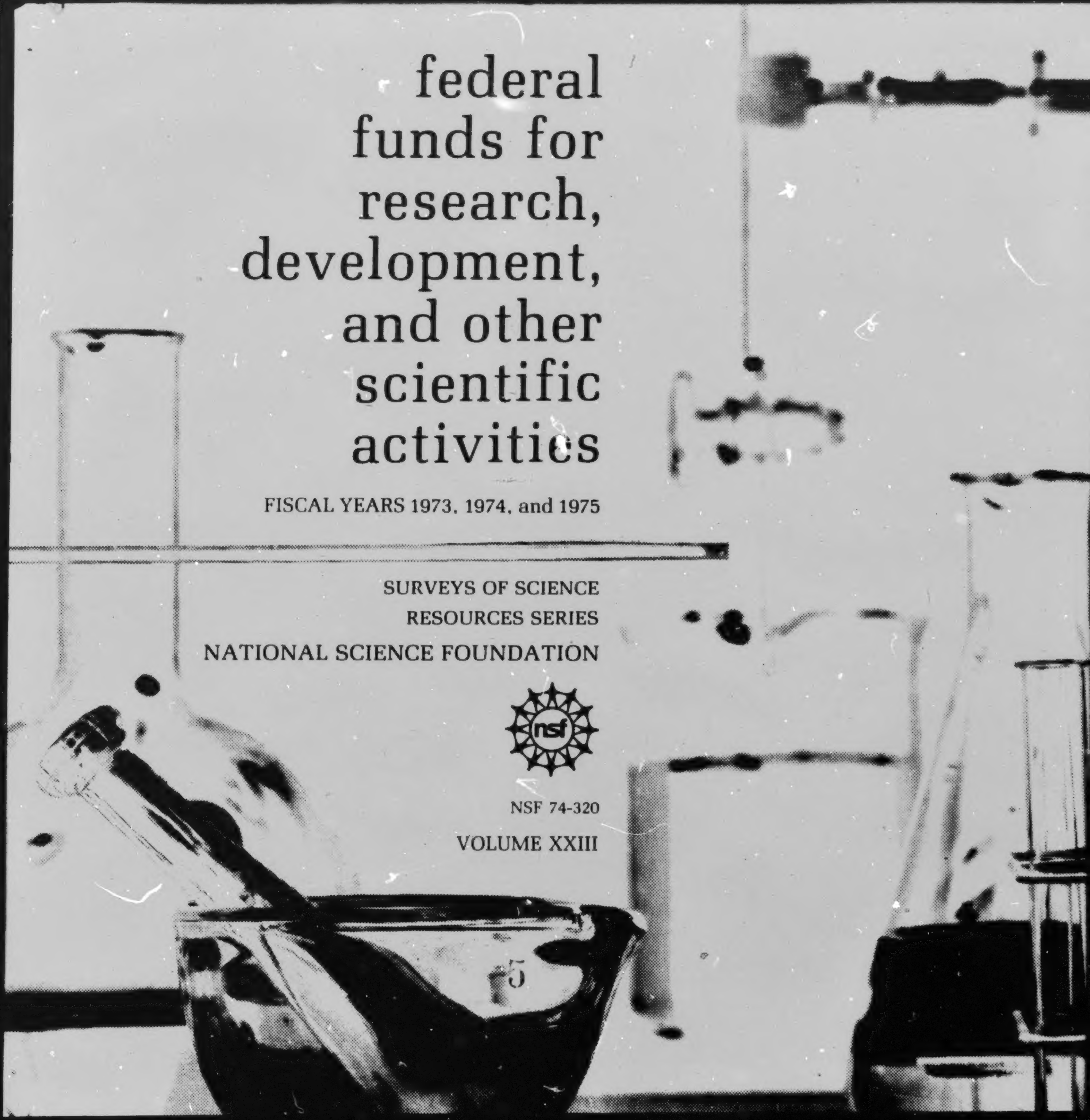

federal funds for research, development, and other scientific activities

FISCAL YEARS 1973, 1974, and 1975

SURVEYS OF SCIENCE
RESOURCES SERIES
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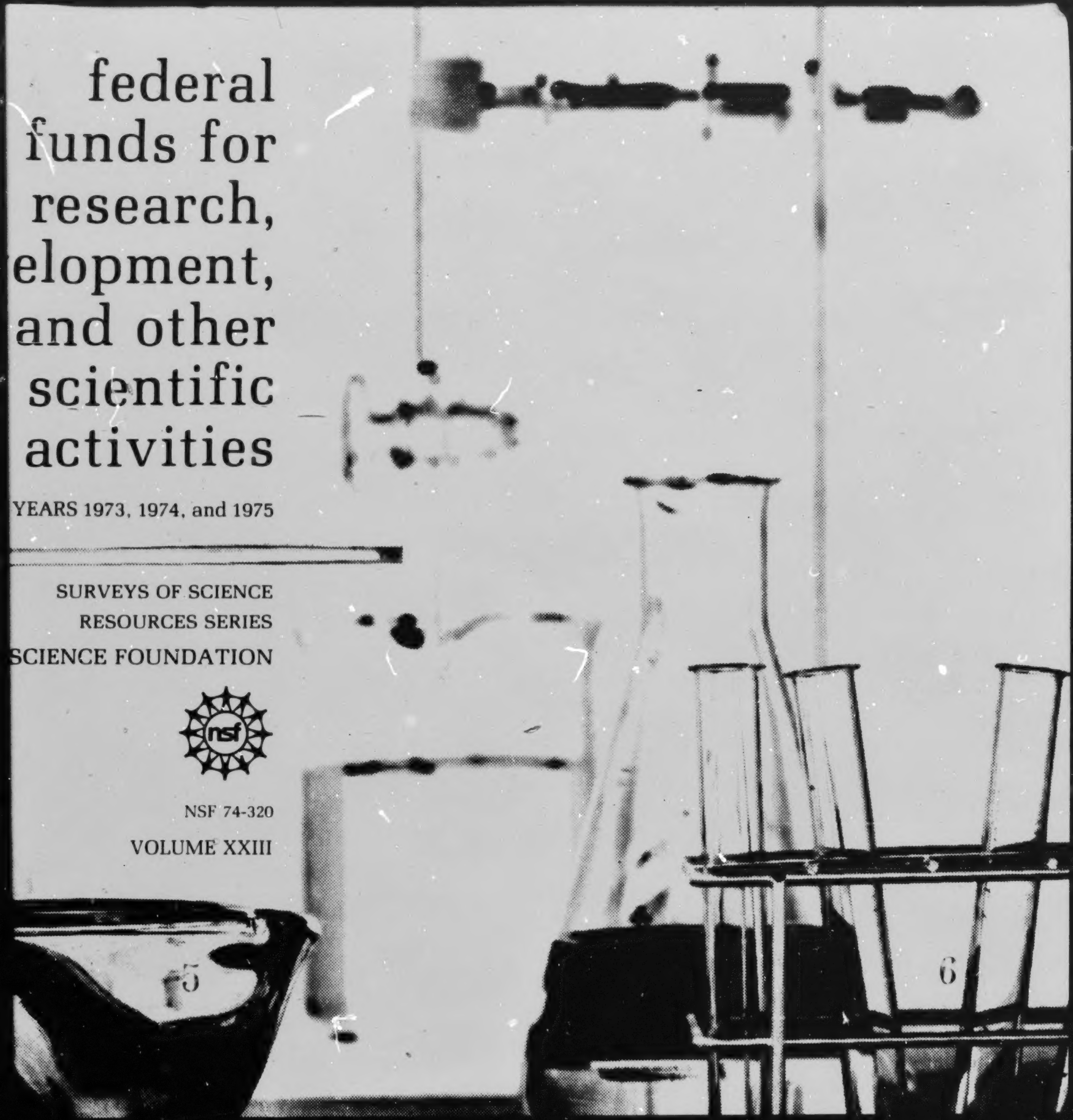
VOLUME XXIII



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FOREWORD

This report is the 23rd in an annual NSF series that provides information on the size and scope of Federal funding for research and development programs. It relates current R&D data, based on the 1973-75 budget cycle, to past trends as well as to broad economic indicators. The data are designed to be useful to a varied audience, especially those concerned with science policy.

The Foundation appreciates the cooperation of the staffs of participating Federal agencies for their special efforts to meet the survey requirements. The report was prepared under the overall guidance of Charles E. Falk, Director, Division of Science Resources Studies, and the special supervision of William L. Stewart, Head, R&D Economic Studies Section.

H. Guyford Stever
Director
National Science Foundation

October 1974

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acknowledgments

This report was prepared in the Division of Science Resources Studies under the direction of Benjamin Olsen, Study Director, Government Studies Group. Responsibility for interpreting the data and for organization and writing of the report was taken by Jane Pugh and Eleanor Stoddard. Dorothy K. Ham prepared the statistical material.

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were for the Department of Defense ($7
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in a *Highlights* in mid-1975 covering fis
next year's report.

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In all tables and charts, details may not
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subsequent appropriations and apportionment actions

The data appearing in this report for fiscal year 1975 were compiled between March and May 1974. They are based on *The Budget of the United States Government, Fiscal Year 1975*, as submitted to the Congress in February 1974, and do not reflect subsequent congressional actions or changes made by Executive apportionment. Based on estimates made in January 1975, these subsequent actions will reduce 1975 Federal R&D obligations from the $19.6 billion appearing in this report to approximately $18.5 billion. The largest estimated reductions were for the Department of Defense ($750 million) and the Department of Health, Education, and Welfare ($140 million). More detailed and further revised information on 1975 R&D obligations will be presented in a *Highlights* in mid-1975 covering fiscal years 1974-76, as well as in next year's report.

notes

In all tables and charts, details may not add exactly to totals because of rounding. Percentages appearing in the text were calculated on the basis of thousands of dollars and may differ from percentages in text tables based on figures rounded to millions of dollars.

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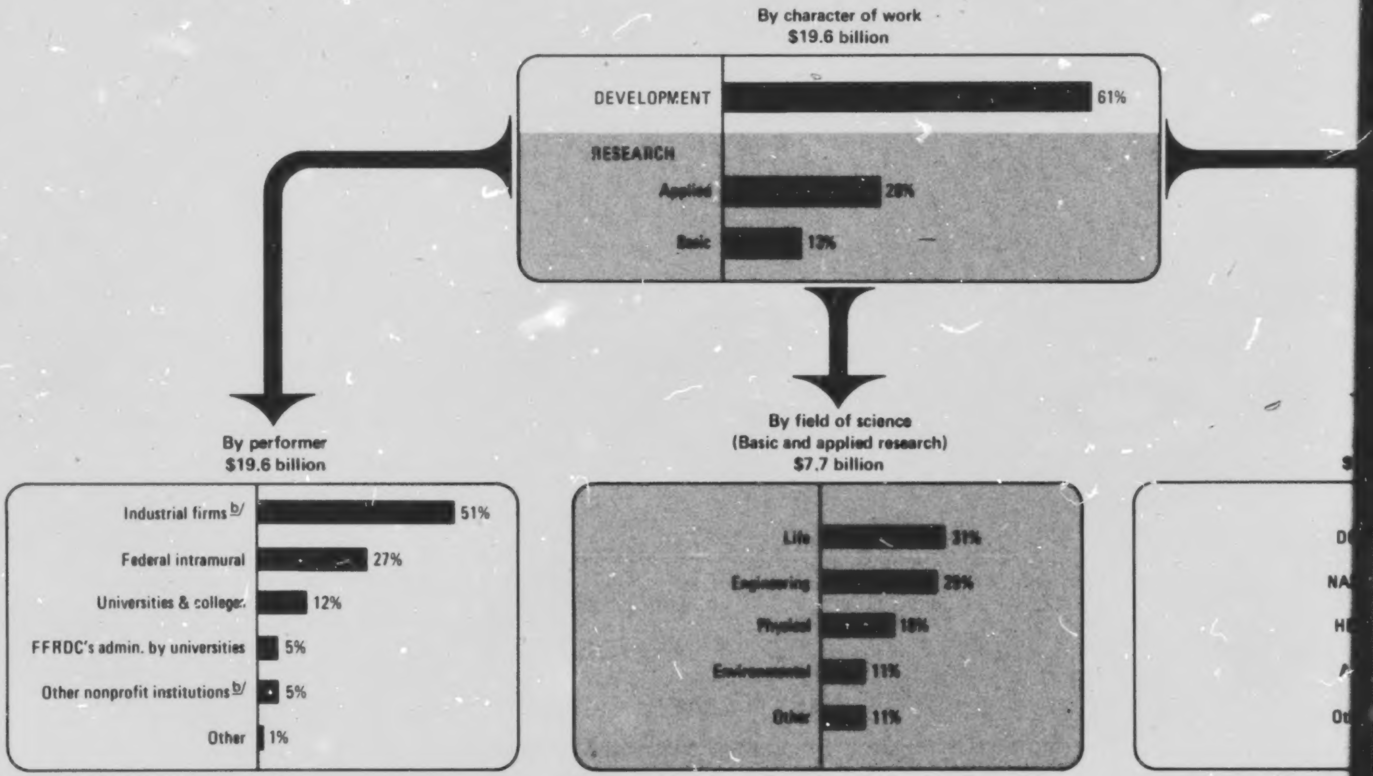
[1] See note on p 49

Distribution of Federal obligations for research and development,[a] FY 1975 (est.)

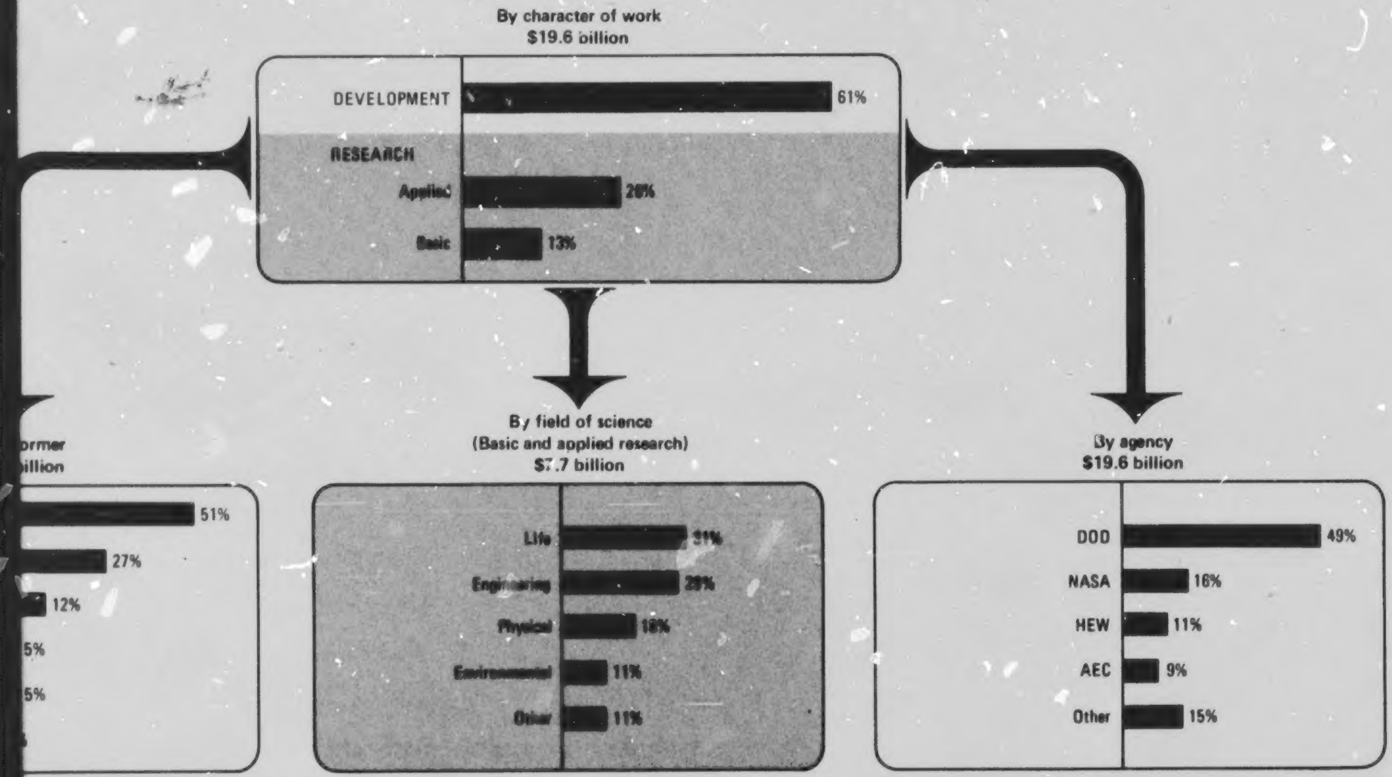


a/ Excludes R&D plant.

b/ Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

SOURCE: National Science Foundation

Distribution of Federal obligations for research and development,[a] FY 1975 (est.)



and Development
this sector.

HIGHLIGHTS

- Federal R&D obligations (plant excluded) are estimated to rise from $16.8 billion in fiscal year 1973 to $17.7 billion in fiscal year 1974 and $19.6 billion in fiscal year 1975. When constant dollars are used, however, the 1974 total is 30 percent lower than the total for 1967, the high point. And with the use of any reasonably estimated deflator, the 1975 figure would be considerably reduced.

- The share of the federal budget represented by R&D programs has continuously declined since the 1965 high. That year the ratio was 12.6 percent, but by 1973 it had dropped to 7.1 percent, and the estimated figure for 1975 is 6.6 percent.

- When measured as a share of relatively controllable outlays[1] —those over which the Executive and the Congress have decisionmaking power—the ratio from 1974 to 1975 shows virtually no change—14.8 percent to 14.7 percent.

- Federal agencies continue to represent the major source of national R&D funding. In 1974 they provided slightly more than one-half of the national R&D total, compared with almost two-thirds in 1965. Industry sources have made up most of the difference in the intervening years.

- The national R&D total was $20.4 billion in 1965, and by 1974 was an estimated $32.1 billion. As a share of the gross national product (GNP), funding for research and development declined from 2.9 percent in 1965 to an estimated 2.3 percent in 1974. Federal R&D funding as a share of GNP declined more steeply: from 1.9 percent to an estimated 1.2 percent.

- In 1975 DOD is expected to account for 49 percent of all Federal R&D obligations, about the level of the previous 10 years, and NASA for 16 percent, down from a 34-percent high point in 1965.

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[1] See Office of Management and Budget, *The Budget of the United States Government, Fiscal Year 1975* (Washington, D. C. 20402: Supt. of Documents, U.S. Government Printing Office), pp. 39, 318-319; and technical notes of this report (appendix A).

- The HEW share has grown from 6 percent
  percent in 1975 and the AEC share from 8
  same timespan. AEC is one of four major
  ment the Federal role in the national energ
  Interior, NSF, and EPA. The increases
  account for approximately one-half of the
  increase.

- Basic research is expected to amount to
  highest level on record. However, in con
  point was in 1967 when the level was 9 perc
  a share of the Federal R&D total, basic re
  percent in 1975; the highest share was 15

- Applied research is also scheduled to reac
  in 1975, at $5.1 billion. Even in constant
  mate would place this level at almost the
  research portion of the Federal R&D total is
  in 1975, as high a share as has been reco

- Development funding, at $11.9 billion in
  record, but in constant dollars the 196
  greatest, 49 percent higher than 1974. The
  the Federal R&D total is an estimated 61
  ratios between 70 percent and 80 percent

- In 1975 an estimated 73 percent of all Fe
  $14.3 billion, will be placed with extr
  remaining $5.3 billion, or 27 percent, will
  The share performed intramurally in the c
  larger than at any time since the middle-to-
  ranged between 30 percent and 36 percen

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  in Federal R&D support over 1972 and rema
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  Federal total was 23.3 percent, compared
  and the Maryland share was 8.7 percent, c
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The Budget of the United States Government, Fiscal
of Documents, U.S. Government Printing Office), pp.
port (appendix A).

- The HEW share has grown from 6 percent in 1965 to an estimated 11 percent in 1975 and the AEC share from 8 percent to 9 percent in the same timespan. AEC is one of four major agencies chosen to implement the Federal role in the national energy program; the others are Interior, NSF, and EPA. The increases for these four agencies account for approximately one-half of the overall 1975 Federal R&D increase.

- Basic research is expected to amount to $2.6 billion in 1975, the highest level on record. However, in constant dollars the highest point was in 1967 when the level was 9 percent above that of 1974. As a share of the Federal R&D total, basic research is an estimated 13 percent in 1975; the highest share was 15 percent in 1972 and 1974.

- Applied research is also scheduled to reach the highest funding level in 1975, at $5.1 billion. Even in constant dollars a reasonable estimate would place this level at almost the highest ever. The applied research portion of the Federal R&D total is expected to be 26 percent in 1975, as high a share as has been recorded.

- Development funding, at $11.9 billion in 1975, is the highest on record, but in constant dollars the 1967 effort was by far the greatest, 49 percent higher than 1974. The 1975 development share of the Federal R&D total is an estimated 61 percent, compared with ratios between 70 percent and 80 percent in the late fifties.

- In 1975 an estimated 73 percent of all Federal R&D obligations, or $14.3 billion, will be placed with extramural performers. The remaining $5.3 billion, or 27 percent, will be obligated intramurally. The share performed intramurally in the current (1973-75) period is larger than at any time since the middle-to-late fifties when the share ranged between 30 percent and 36 percent.

- In 1973 both California and Maryland reflected substantial increases in Federal R&D support over 1972 and remained in the "more than $1 billion" category, the only States to do so. The California share of the Federal total was 23.3 percent, compared with 35.1 percent in 1963, and the Maryland share was 8.7 percent, compared with 5.5 percent in 1963. The next three States in order of Federal R&D funding in 1973 were Massachusetts, Florida, and New York.

INTRODUCTION

The National Science Foundation is the primary producer of data on the science resources of the United States, a function that the agency has fulfilled since its inception in 1950. Since 1952 NSF has published reports on Federal funding of research and development, thus providing a continuing measure of a major science input area.

The source of data for the *Federal Funds for Research, Development, and Other Scientific Activities* series is the Federal agency establishment. For the current volume, covering fiscal years 1973-75, a detailed questionnaire was distributed early in 1974 and completed by 93 agencies and agency subdivisions in the March-May period. Data were edited and processed by NSF and complete appendix tables prepared. These tables were made separately available in advance of this report.[1]

The historical record developed by the *Federal Funds* time series shows changes in the deployment of Federal funds for various kinds of R&D activities. The present report covers R&D funding by agency, performing sector, character of work (basic research, applied research, and development), and field of science, as well as by State distribution. R&D plant data are additionally given. A separate part of the report deals with scientific and technical information activities. Not all of these elements were included when the *Federal Funds* effort began so that the timespans of the various series differ somewhat.

Like other recurrent NSF science resources surveys, *Federal Funds* links respondents and data producers and users in a continuing interchange. New measures of R&D activity have been added over the years in response to user needs, and on occasion a measure has been dropped. Changes have been made in instructions, on agency request, and feasibility tests have been conducted to determine reporting capability for new data elements. An innovation in the current *Federal Funds* publication (Volume XXIII) is a series for fiscal years 1973-75 on Federal research support to universities and colleges by field of science, requested by a science policy group.

The data shown in this edition of *Fed*
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Agencies are users of the data as
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thus, meet a wide range of uses for va
broad, and *Federal Funds* is limited by
visible the magnitude and structu
engagement, this series provides a p
basis for more detailed analyses of
impacts.

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[1] National Science Foundation, *Detailed Statistical Tables, Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1973, 1974, and 1975*. Vol. XXIII (NSF 74-320A) (Washington, D. C.), 1974. These may be obtained gratis on request to NSF.

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The data shown in this edition of *Federal Funds* are comparable to those included in "Special Analysis 0 (Revised): Federal Research and Development Programs" in *The Budget of the United States Government, Fiscal Year 1975*, as submitted to Congress in February 1974. The same definitions for research and development and R&D plant are used in both reports. Some differences exist between the reports in dollar amounts reported because of the different times of agency response, but both reports include the additional amount for energy R&D programs in the revised 1975 budget. The *Federal Funds* report, however, provides detail on research, performers, fields of science, and geographic distribution not provided in the *Special Analysis.*

The *Federal Funds* survey is based on the budget cycle with all data reported in comparable categories for a 3-year period. Data for 1973 reflect transactions of a completed fiscal year and, thus, are "actual." Data for 1974 are subject to reprogramming and apportionment actions and for 1975 to reprogramming, appropriation, and apportionment actions, and hence are estimated.

Most data do not represent accounting precision. Most agency R&D programs are not identified as budget line items, although a number of them are so identified. For this reason R&D programs usually have to be separated from larger appropriation accounts, and occasionally questions arise as to the exact definition of R&D activities. Also, the assignment of dollar amounts to basic research, applied research, development, and fields of science is sometimes judgmental. The years of experience of most agencies in fulfilling the *Federal Funds* survey requirements, however, help to make for a reliable quantification of R&D program features.

Agencies are users of the data as well as partial producers, and this fact serves to increase the feedback between NSF staff and survey respondents in developing greater accuracy and detail, clarifying definitions, and reformulating data. Other users include members of Congress and congressional committee staffs, and science policy-makers in the Executive branch, as well as the science and academic communities, industry, research institutes, and the press. The data, thus, meet a wide range of uses for varied audiences. The coverage is broad, and *Federal Funds* is limited by this very breadth, but in making visible the magnitude and structure of the whole Federal R&D engagement, this series provides a perspective that can serve as the basis for more detailed analyses of trends, outputs, outcomes, and impacts.

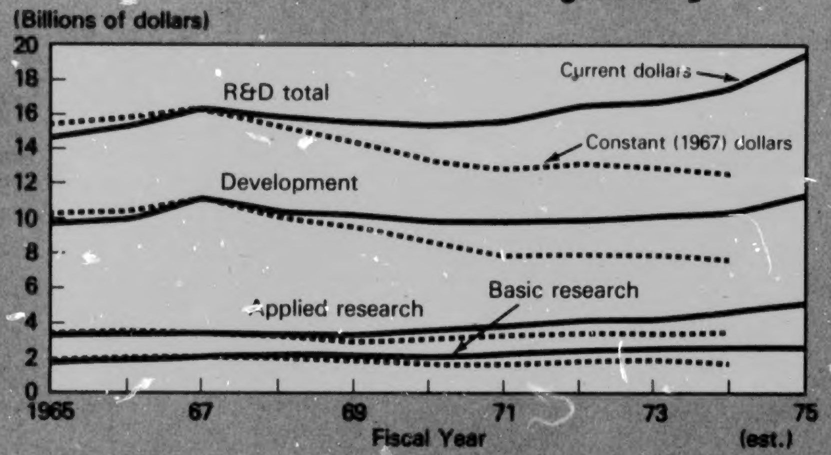
Part I

FEDERAL FUNDS FOR RESEARCH, DEVELOPMENT AND R&D PLANT

Section 1. FEDERAL R&D PERSPECTIVES

Since 1970 total Federal R&D obligations have traced a rising curve, after having fallen steadily from an earlier 1967 peak. In terms of real performance, however, recent Federal R&D program levels have not been rising. The three years of the current budget period reflect for fiscal year 1973 an R&D total of $16.8 billion (plant excluded) and

Trends in Federal R&D obligations



Average Annual Percent Change

Character of work	1960-67	1967-73	1973-74	1974-75
Current dollars				
R&D total	11.8	(b)	5.5	10.4
Research	15.4	5.3	10.7	6.6
Basic research	18.5	3.2	1.2	1.2
Applied research	13.[illegible]	3.8	13.4	9.6
Development	10.5	−1.5	2.2	13.1
Constant dollars[a]				
R&D total	9.9	−3.8	−2.3	(c)
Research	13.4	− .8	2.5	(c)
Basic research	4.2	−1.1	−1.8	(c)
Applied research	11.7	− .6	5.0	(c)
Development	8.5	−5.6	−5.6	(c)

[a] Based on GNP implicit price deflator.
[b] Less than 0.05 percent.
[c] Not available.

SOURCE: National Science Foundation

estimated totals for fiscal year 1974 of $17.7
1975 of $19.6 billion. The last two years sho
and 10.4 percent, respectively. But when
these increases disappear and the recent hi
well below those of a decade earlier.

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from 1963 onward. Furthermore, any rea
would produce for 1975 a decided reducti
proposed for that year. The 1970-75 peri
performance levels lower than those prevail

In the 1970-75 period the totals of the
programs are primarily concerned with de
equipment, and instrumentation, mostly for
show decreases in constant dollars, wherea
whose R&D programs are designed to mee
show a decided increase. The Departme
example, is scheduled in the current (197
R&D totals on record, but in real terms the
and are in a lower range than the agency's e
The National Aeronautics and Space A
received decreasing funds almost steadil
Energy Commission (AEC) received decre
through 1972, and the increases since then
only in 1975 and that a very slight one. By
1970 to 1975 the R&D programs of the Depar
and Welfare (HEW), the National Scien
Departments of the Interior and Agri
Environmental Protection Agency (EPA)
increases in real support.

One effect of these changes in Federal
the share of research versus developme
obligational levels. In 1965 the basic resea
percent of the R&D total, the applied resea
and the development share, 67 percent. In
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R&D PERSPECTIVES

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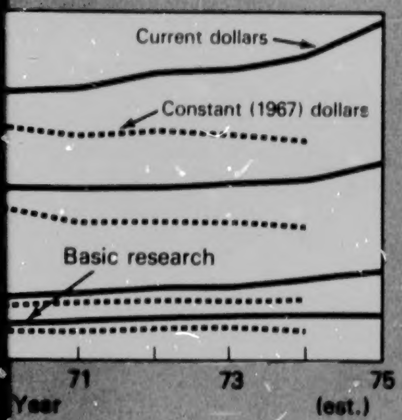


Percent Change

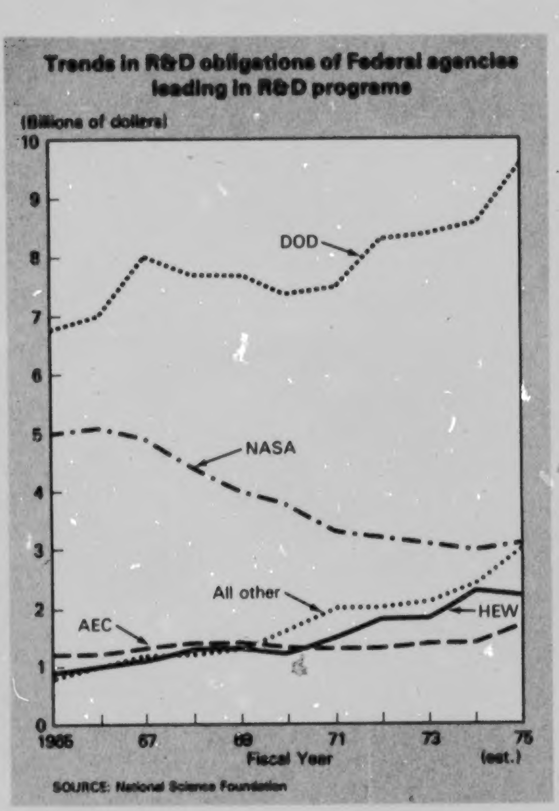
1967-73	1973-74	1974-75
(b)	5.5	10.4
5.3	10.7	6.6
3.2	1.2	1.2
3.8	13.4	9.6
−1.5	2.2	13.1
−3.8	−2.3	(c)
− .8	2.5	(c)
−1.1	−1.8	(c)
− .6	5.0	(c)
−5.6	−5.6	(c)

estimated totals for fiscal year 1974 of $17.7 billion and for fiscal year 1975 of $19.6 billion. The last two years show increases of 5.5 percent and 10.4 percent, respectively. But when constant dollars are used, these increases disappear and the recent highs are converted to levels well below those of a decade earlier.

The estimated 1974 R&D performance is less than that of any year from 1963 onward. Furthermore, any reasonably estimated deflator would produce for 1975 a decided reduction in the relative increase proposed for that year. The 1970-75 period, thus, actually reflects performance levels lower than those prevailing from 1963 through 1969.

In the 1970-75 period the totals of the three agencies whose R&D programs are primarily concerned with developing heavy machinery, equipment, and instrumentation, mostly for military or space purposes, show decreases in constant dollars, whereas the totals of the agencies whose R&D programs are designed to meet a range of civilian needs show a decided increase. The Department of Defense (DOD), for example, is scheduled in the current (1973-75) period for the highest R&D totals on record, but in real terms these totals reflect no growth and are in a lower range than the agency's effort for 1961 through 1969. The National Aeronautics and Space Administration (NASA) has received decreasing funds almost steadily since 1966. The Atomic Energy Commission (AEC) received decreased R&D funds from 1970 through 1972, and the increases since then would represent a true rise only in 1975 and that a very slight one. By contrast, in the period from 1970 to 1975 the R&D programs of the Department of Health, Education, and Welfare (HEW), the National Science Foundation (NSF), the Departments of the Interior and Agriculture (USDA), and the Environmental Protection Agency (EPA) have represented notable increases in real support.

One effect of these changes in Federal priorities has been to raise the share of research versus development in overall Federal R&D obligational levels. In 1965 the basic research component made up 11 percent of the R&D total, the applied research component, 22 percent, and the development share, 67 percent. In 1975 the estimated shares are basic research, 13 percent; applied research, 26 percent; and development, 61 percent. Both the basic and the applied research efforts have held their own in real terms in the 1965-75 decade whereas the development effort has decreased considerably.



Trends in R&D obligations of Federal agencies leading in R&D programs

SOURCE: National Science Foundation

1975 Budget Emphases

The budget for 1975 confirmed that research and development continue to be a necessary adjunct of Federal operating policy. Most established R&D programs were maintained at levels close to those of 1974, although some were decreased in line with changing priorities. The overall rise for 1975 was derived from increases on the military side for DOD and on the civilian side for certain agencies that were chosen to carry forward the development of a stronger national energy base. These agencies were Interior, AEC, NSF, and EPA. Their energy-related programs are discussed in the next section.

Even with the upward direction in 1975 funding, the DOD portion of the Federal R&D total is still about one-half (an estimated 49 percent). The NASA share is expected to fall to 16 percent, compared with a high of 34 percent in 1965. The HEW share has grown from 6 percent in 1965 to an estimated 11 percent in 1975, while the AEC share has scarcely changed. In 1965 it was 8 percent and in 1975 will be an anticipated 9 percent.

These four agencies are distinguished by the fact that each one makes up an imposing share of the Federal R&D total and that together they dominate the funding picture. Yet the combined share of the other 30 agencies reporting R&D programs in the 1973-75 period has reached a significant size. From the 5 percent that the "other" agencies supported in 1965, they have risen to an estimated 14 percent of the support total in 1975, reflecting the growing public awareness that scientific resources must be brought to bear on the solution of a variety of national problems.

R&D Plant

Federal obligations for R&D plant were expected to rise from $774 million in 1973 to $972 million in 1974 and to $1,113 million in 1975. The levels for 1974 and 1975 are higher than for any year since 1965. AEC continues to provide the major support for R&D plant, making up 40 percent of the Federal total in 1975. Next in size of support is DOD, accounting for 17 percent of the total. The largest relative gain is shown by Interior, whose share of 15 percent in 1975 almost entirely represents an increase in funding for the energy-oriented R&D facilities of the Office of Coal Research.

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Fiscal year	Tot bud outl
1940.....	$ 9,
1941.....	13,
1942.....	34,
1943.....	78,
1944.....	93,
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1948.....	36
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1967.....	15
1968.....	17
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1972.....	23
1973.....	24
1974 (est)[4]	27
1975 (est)[4]	30

[1] Beginning in fiscal
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SOURCES: Office
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Even with the upward direction in 1975 funding, the DOD portion of the Federal R&D total is still about one-half (an estimated 49 percent). The NASA share is expected to fall to 16 percent, compared with a high of 34 percent in 1965. The HEW share has grown from 6 percent in 1965 to an estimated 11 percent in 1975, while the AEC share has scarcely changed. In 1965 it was 8 percent and in 1975 will be an anticipated 9 percent.

These four agencies are distinguished by the fact that each one makes up an imposing share of the Federal R&D total and that together they dominate the funding picture. Yet the combined share of the other 30 agencies reporting R&D programs in the 1973-75 period has reached a significant size. From the 5 percent that the "other" agencies supported in 1965, they have risen to an estimated 14 percent of the support total in 1975, reflecting the growing public awareness that scientific resources must be brought to bear on the solution of a variety of national problems.

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Federal obligations and expenditures, fiscal years 1940-75

[Dollars in millions]

Fiscal year	Total budget outlays[2]	Research, development, and R&D plant[1]		Expenditures as percent of total budget outlays
		Obligations	Expenditures	
1940	$ 9,589	(3)	$ 74	0.8
1941	13,980	(3)	198	1.4
1942	34,500	(3)	280	.8
1943	78,909	(3)	602	.8
1944	93,956	(3)	1,377	1.5
1945	95,184	(3)	1,591	1.7
1946	61,738	(3)	918	1.5
1947	36,931	$ 691	900	2.4
1948	36,493	868	855	2.3
1949	40,570	1,105	1,082	2.7
1950	43,147	1,175	1,083	2.5
1951	45,797	1,812	1,301	2.8
1952	67,962	2,195	1,816	2.7
1953	76,769	3,361	3,101	4.0
1954	70,890	3,039	3,148	4.4
1955	68,509	2,745	3,308	4.8
1956	70,460	3,267	3,446	4.9
1957	76,741	4,389	4,462	5.8
1958	82,575	4,906	4,991	6.0
1959	92,104	7,123	5,806	6.3
1960	92,223	8,080	7,744	8.4
1961	97,795	9,607	9,287	9.5
1962	106,813	11,069	10,387	9.7
1963	111,311	13,663	12,012	10.8
1964	118,584	15,324	14,707	12.4
1965	118,430	15,746	14,889	12.6
1966	134,652	16,179	16,018	11.9
1967	158,254	17,149	16,859	10.7
1968	178,833	16,525	17,049	9.5
1969	184,548	16,310	16,348	8.9
1970	196,588	15,865	15,736	8.0
1971	211,425	16,175	15,992	7.6
1972	231,876	17,014	16,743	7.2
1973	246,526	17,596	17,510	7.1
1974 (est)[4]	274,660	18,715	18,552	6.7
1975 (est)[4]	304,445	20,710	20,154	6.6

[1] Beginning in fiscal year 1953 amounts for both obligations and expenditures include pay and allowance of military personnel in research and development.

[2] "Outlays" include expenditures plus net lending. Data through fiscal year 1953 are in terms of the "Consolidated Cash Statement" and data beginning with fiscal year 1954 are in terms of the "Unified Budget." For purposes of providing trend information the data are considered to be reported on a generally comparable basis.

[3] Not available.

[4] These estimates are based on amounts shown in *The Budget, 1975* and do not reflect congressional appropriations or changes made by Executive action subsequent to budget submission at the midpoint of fiscal 1974.

SOURCES: Office of Management and Budget and Bureau of the Budget. *The Budget of the United States Government,* fiscal years 1940 through 1975; National Science Foundation, annual surveys of R&D programs of Federal agencies.

Relationship to Total Budget

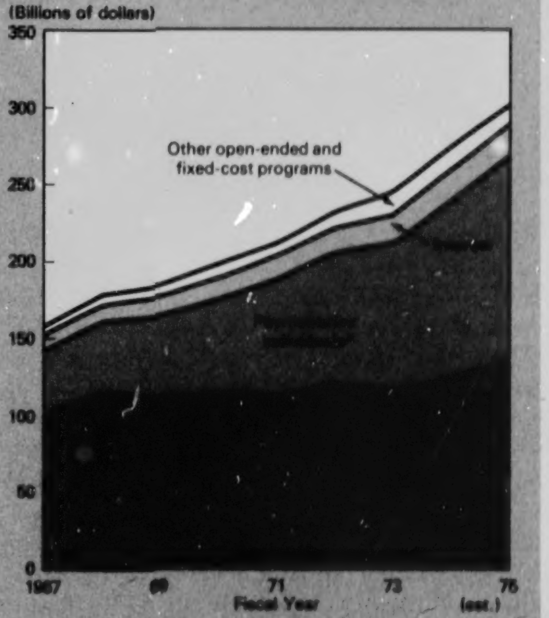
Federal R&D funding has moved in cycles. As a share of the Federal budget, R&D support was small in the early forties and fluctuated from year to year. In the post-World War II era the R&D and R&D plant ratio, though slightly larger, stayed in a narrow range between 2 percent and 3 percent for a protracted period.[1] Then, in 1953 the funding began an uninterrupted 13-year climb that culminated in the high of 12.6 percent reached in 1965. This period included military and atomic development programs and the space buildup preparatory to placing a man on the moon.

At that point new and heavy demands began to be placed on Federal funding in the form of social insurance costs and added defense outlays. Overall R&D totals rose in the 1966-68 period to the highest points on record but thereafter ceased to grow. Meanwhile, the share of R&D and R&D plant programs in the total budget had started to fall. Only in the current (1973-75) period are the earlier R&D dollar highs surpassed, although at the same time the rapid growth of the total Federal budget is causing the R&D ratio to decline still further. Thus, in 1973 the R&D and R&D plant share was 7.1 percent, and by 1975 it is expected to be just 6.6 percent.

Despite this trend for the overall budget, R&D funding has not been given lower priority in recent years in Federal plans and appropriations. Within the portion of the budget over which the Executive and the Congress have annual decisionmaking power, R&D program levels are at present showing no real tendency to decline as a share of the total.

Between 1967 and 1975 total Federal budget outlays rose from $158.3 billion to an estimated $304.4 billion. Most of this expansion was caused by fixed cost and open-ended programs that increase by law rather than annual appropriations; e.g., social and medical insurance, veterans payments, and interest on the public debt. When such programs are eliminated, the relatively controllable portion of the budget, which includes R&D and R&D plant expenditures, is seen to have risen from $103.1 billion in 1967 (earliest calculable year) to an estimated $136.7 billion in 1975. As a share of

Federal budget outlays by relatively uncontrollable and controllable components



*Social insurance, housing payments, and public assistance minus undistributed employer share and employee retirement.

SOURCES: Office of Management and Budget; National Science Foundation

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[1] For comparisons with budget outlays R&D and R&D plant expenditures are used rather than obligations. See text table on Federal obligations and expenditures.

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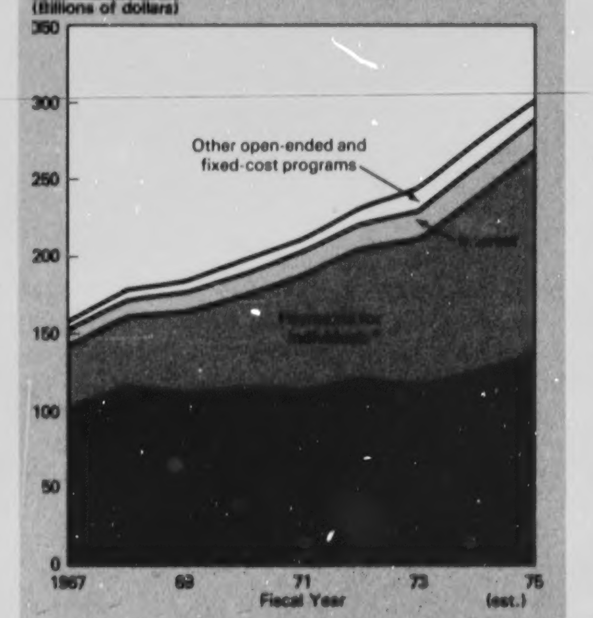
Federal budget outlays by relatively uncontrollable and controllable components



*Social insurance, housing payments, and public assistance minus undistributed employer share and employee retirement.

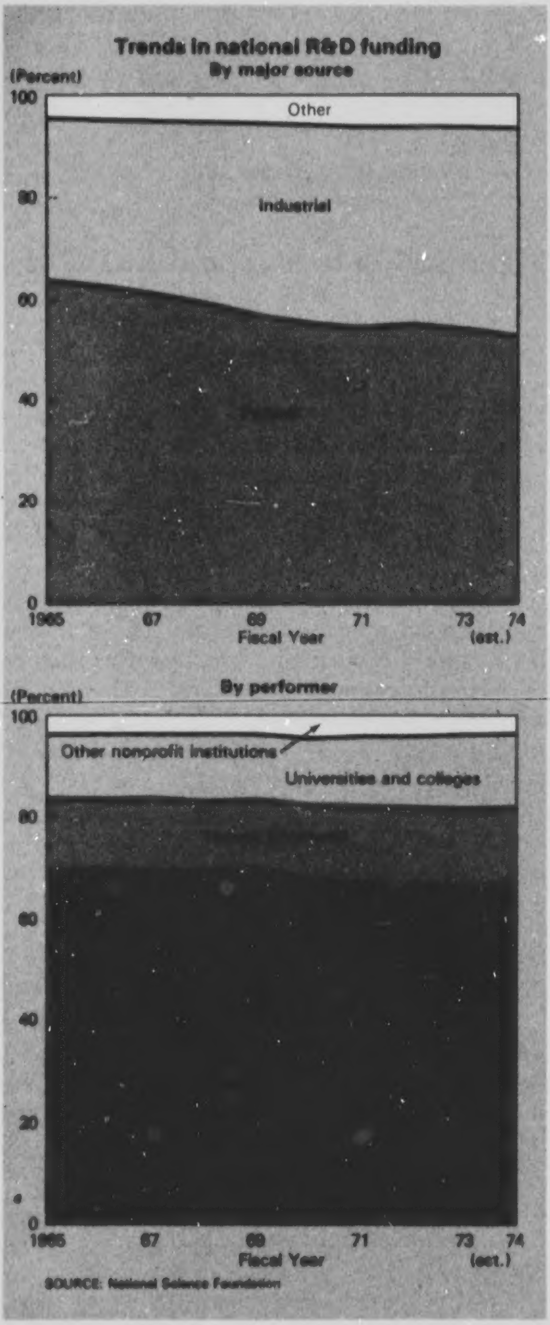
SOURCES: Office of Management and Budget; National Science Foundation

Relationship to National R&D Total

Federal support to research and development has a strong effect on national R&D activity as a whole. This is because the Federal Government has for many years supplied between one-half and two-thirds of the funding for all the R&D work carried out in the economy. In 1965 the share supported by Federal agencies was 64 percent, and in 1974 the anticipated share is 53 percent. Industry has supplied most of the difference over the intervening years as its own R&D investment has grown. Thus, in 1965 industry provided 32 percent of the funds, whereas by 1974 it was expected to provide 41 percent. In this time period, R&D funding from all non-Federal sources, mostly industry, not only increased in current dollars as a share of the national total but also increased on a constant dollar basis.

National R&D totals have risen steadily between 1965 and 1974, although at an uneven pace. The total in 1965 was $20.4 billion and by 1974 it had become an estimated $32.1 billion. By 1969, 1970, and 1971 the yearly rate of growth was decidedly diminished, but for 1973 and 1974 the growth rate had again increased, to an estimated 5 percent in each year.

Performance must be distinguished from support. In all years industry has been the major R&D performer nationally, accounting for 67 percent of the workload in 1974. This


Trends in national R&D funding

SOURCE: National Science Foundation

share compares with a 69-percent share in 1965. At that time universities and colleges accomplished 12 percent of the national R&D effort, although for 1974 their estimated share is 15 percent. Thus, the university sector has undertaken in this period a measurably larger portion of national R&D performance. Federal intramural performance has accounted for 15 percent of the national R&D total in most years in the past decade and in some years somewhat less.

Relationship to GNP

The relationship of R&D efforts to economic growth and productivity is a subject of considerable study and interest at the present time. Therefore, brief data are included here on R&D/GNP ratios.

In 1965 the share of national R&D activities in the gross national product (GNP) was 2.9 percent and was virtually the same in 1966 and 1967, but each year thereafter the ratio has declined somewhat and is an estimated 2.3 percent in 1974.

During the same period the share of the Federal R&D effort in the GNP total has also declined, although more steeply. In 1965 the Federal R&D/GNP ratio was 1.9, but by 1974 it was an estimated 1.2.[2] In these years Federal dollar support within the national R&D effort declined relatively and, when adjusted for inflation, declined absolutely as well.

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[2] The R&D/GNP ratios are close approximations because of the fact that R&D data for performing sectors vary slightly from one report to another. See National Science Foundation, *National Patterns of R&D Resources, 1953-1974: Funds & Manpower in the United States* (NSF 74-304) (Washington, D.C. 20402: Supt. of Documents, U.S. Government Printing Office), 1974. The Federal R&D funding totals in that report differ slightly from those shown in this report because they are derived from performer sources.

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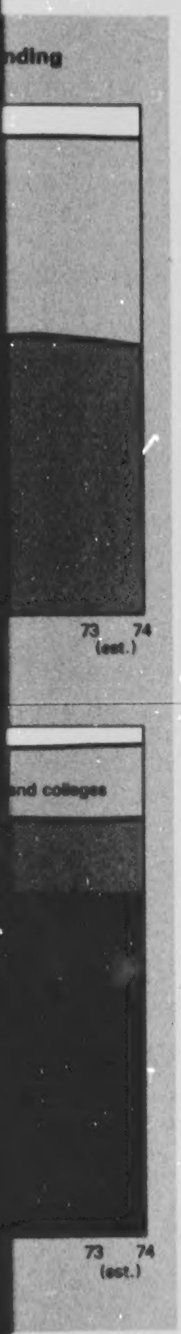

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Comparisons With Other Countries

As already mentioned, the national R&D/GNP ratio for the United States has shown a moderate but steady decrease since 1967. This trend can be compared with those of other leading industrial nations. In the late sixties the United Kingdom and France reflected only slight change from one year to the next in their GERD/GNP ratios, but after 1969 their ratios also declined. (See chart.) For Canada the change throughout the 1965-73 period was insignificant. By contrast, West Germany reflected a steady rise in its ratio after 1968, and the best estimates available indicate an increase for Japan between 1967 and 1973, despite a drop between 1971 and 1973.[3]

For all the countries except the United States the 1973 ratios are derived from estimates based on data from a number of sources and are, therefore, subject to revision. Nonetheless, these data indicate that the United States no longer appears to sustain the highest ratio; West Germany and the United Kingdom are at approximately the same level.

Since R&D efforts bear a relationship to the output of technology intensive products, the United States' changing trade position in such products vis-a-vis Japan, West Germany, and other Western countries has been studied with R&D/GNP ratios as part of the background.[4] These ratios can also be used

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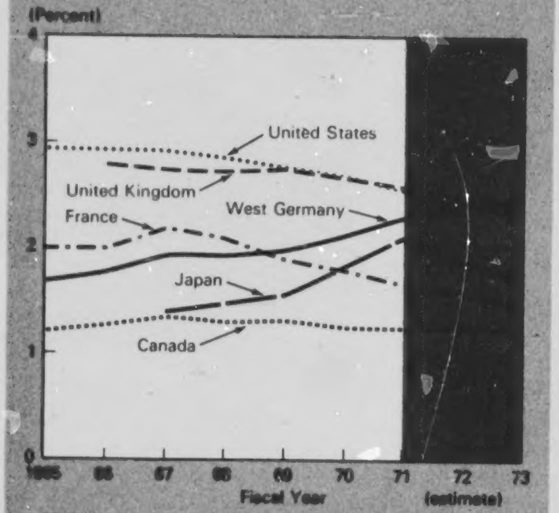
[2] The R&D/GNP ratios are close approximations because of the fact that R&D data for performing sectors vary slightly from one report to another. See National Science Foundation, *National Patterns of R&D Resources, 1953-1974: Funds & Manpower in the United States* (NSF 74-304) (Washington, D.C. 20402: Supt. of Documents, U.S. Government Printing Office), 1974. The Federal R&D funding totals in that report differ slightly from those shown in this report because they are derived from performer sources.

[3] For all these countries gross expenditures for research and development (GERD) was used in computing the ratios. GERD is distinguished from R&D proper in that it includes R&D plant. For the United States *national* data on R&D plant expenditures have not been available because of different reporting conditions and, thus, only R&D data were used, causing U.S. ratios to be somewhat understated.

[4] For example, see *Science, Technology and the Economy*. Hearings before the Subcommittee on Science, Research, and Development, Committee on Science and Astronautics. 92 Cong., 2nd sess. (April 11, 12, 13, 18, 20, 1972).



Trends in R&D/GNP ratios of leading industrial countries, FY 1965-73

SOURCES: Organization for Economic Cooperation and Development and individual country data, 1965-71; ratios for 1973 estimated by the National Science Foundation on the basis of these sources.

to provide trend data for individual countries, which can be related to economic growth and other variables.

The U.S.S.R. was not included in the chart because the method of computing the GERD/GNP ratio for this country is significantly different than that used for the other countries. Both GERD and GNP data have to be calculated from fragmented sources to attain comparability with series used in non-Communist countries. Recent analysis indicates a rise in the GERD/GNP ratio for the U.S.S.R. between 1969 and 1972 and a ratio of 3.6 in 1972, the latest obtainable year.[5]

The figures given in this whole discussion are broadly derived and can be used as measures of relative magnitude and general trends only. They may, however, suggest areas of further investigation.

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[5] Estimates made by Dr. Robert W. Campbell, Indiana University.

Section 2. PROGRAMS AND PERFORMERS

Current Programs

- In 1975 DOD, as has been the case for many years, accounts for approximately one-half (49 percent) of all Federal R&D obligations. The scheduled increase of $1,009 million for this agency outweighs any other agency increase.[6]

- The DOD increase was derived from planned expansion for a number of programs. The greatest rise among the services was shown by the Navy, where efforts on the Trident submarine ballistic missile system, the strategic cruise missile system, the CH-53E helicopter, and the VFX fighter prototype commanded most of the additional funds. Next in size of increase was the Air Force, and chief programs contributing to higher funding for this service were the air-launched cruise missile, Minuteman III, advanced ICBM technology, the Advanced Warning and Control System (AWACS), the Advanced Airborne Command Post, the B-1 advanced strategic bomber, the EF-111A electronic warfare support aircraft, and the new air combat fighter. The net rise for the Army is small, yet such individual programs as the Site Defense of Minuteman, tactical forward area air defense systems, and the advanced attack helicopter were expanded significantly.

- NASA reflects such a slight rise for 1975 that it amounts to a leveling off. Within the overall R&D total the NASA share is estimated at 16 percent. Despite the fact that in the 1975 budget Skylab is no longer funded and large declines are planned in lunar and planetary exploration and in the communications satellite program, plans for other NASA programs produce a net increase. The greatest of these by far is for the space shuttle. Another manned space flight program to receive higher support is the Apollo-Soyuz Test Project, jointly conducted between the United States and the U.S.S.R. Under physics and astronomy major attention is directed to work on three High Energy Observatories.

- HEW continues to maintain an 11-per
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Agency	Actual
	1973
Total	$16,821
Department of Defense	8,404
National Aeronautics and Space Administration	3,061
Department of Health, Education, and Welfare	1,838
Atomic Energy Commission	1,363
National Science Foundation	480
Department of the Interior	243
Department of Agriculture	367
Department of Transportation	311
Environmental Protection Agency	181
Department of Commerce	191
Office of Economic Opportunity	109
Other agencies	275

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[6] On the basis of congressional appropriation action the DOD increase was reduced by approximately $750 million.

RAMS AND PERFORMERS

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- HEW continues to maintain an 11-percent share of the Federal R&D obligational total in 1975 despite a $115 million reduction in its overall program. The chief reason is that $162 million in funds for the National Institutes of Health (NIH), originally scheduled for obligation in 1973, was not obligated until 1974, causing that year to be unexpectedly high. Nine out of 10 NIH institutes show decreases in 1975; only the National Cancer Institute is scheduled for increased support. HEW's Alcohol, Drug Abuse, and Mental Health Administration will be cut back. On the education side, the National Institute of Education was expected to receive a sizable increase in 1975, but this rise was entirely offset by the decrease in funding reported for the Office of Education (the latter decline due to the nonreporting of vocational R&D activities pending passage of proposed consolidated education grants legislation).

Federal obligations for research and development, by agency

[Dollars in millions]

Agency	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$16,821	$17,743	+ 5.5	$19,597	+ 10.4
Department of Defense	8,404	8,599	+ 2.3	9,608	+ 11.7
National Aeronautics and Space Administration	3,061	3,026	− 1.1	3,071	+ 1.5
Department of Health, Education, and Welfare	1,838	2,347	+ 27.7	2,233	− 4.9
Atomic Energy Commission	1,363	1,431	+ 5.0	1,704	+ 19.1
National Science Foundation	480	530	+ 10.4	653	+ 23.3
Department of the Interior	243	286	+ 17.5	557	+ 94.8
Department of Agriculture	367	386	+ 5.4	406	+ 5.0
Department of Transportation	311	358	+ 15.3	397	+ 10.7
Environmental Protection Agency	181	174	− 3.7	343	+ 96.8
Department of Commerce	191	210	+ 10.2	263	+ 25.1
Office of Economic Opportunity	109	50	− 54.5	—	—
Other agencies	275	348	+ 26.2	363	+ 4.8

- The AEC $273 million increase for 1975 is second only to that for DOD and will raise the AEC share of the overall R&D obligational total slightly — to 9 percent. Aside from relatively small increases for weapons R&D and testing and for naval reactor development, the bulk of the expansion is directed to energy work. The 1973 fuel crisis engendered a long-range national energy program in which the R&D effort of AEC was chosen for a central role. Civilian reactor development is the heart of the AEC program with chief activity focused on the liquid metal fast breeder reactor. Gas cooled and molten salt breeder reactor programs were also expanded as was general reactor safety analysis. The highest relative gain for any program in 1975 was scheduled for controlled thermonuclear fusion research.

- The gain of $124 million for NSF was brought about by the same forces that raised the AEC level. In 1975 the share of NSF in the Federal R&D total is an estimated 3 percent. The growth for NSF is primarily derived from increases for basic research project support and for the RANN (Research Applied to National Needs) program. Most of the increases for support of basic research are to encourage work that could eventually contribute to energy self-sufficiency, and within RANN the increases are directed to research on solar and geothermal energy and to the energy research and technology effort (energy conversion and storage, systems, and resources, advanced automotive propulsion, and energy and fuel transportation projects).

- The increase for Interior of $271 million for 1975 is the third highest in dollars and almost the highest relatively of any agency, at 95 percent. Again, almost all of this growth can be attributed to energy-related R&D programs. Work in fossil fuels is primarily an Interior responsibility, and more than one-half of the Interior increase for 1973 is found in this area: for the Office of Coal Research on coal liquefaction, gasification, direct combustion, and advanced power systems, and for the Bureau of Mines on coal, petroleum, and oil shale R&D programs. In addition, the Office of the Secretary has expanded research programs in 1975 on underground electric transmission, energy conservation, and mined area protection, and the Bureau of Land Management has a new research program on the marine environment. Partly in response to energy needs, the mining technology program of the Bureau of Mines has a large planned increase, as does the Geological Survey for mineral resources surveys and special environmental projects.

- The Department of Agriculture (USDA) w
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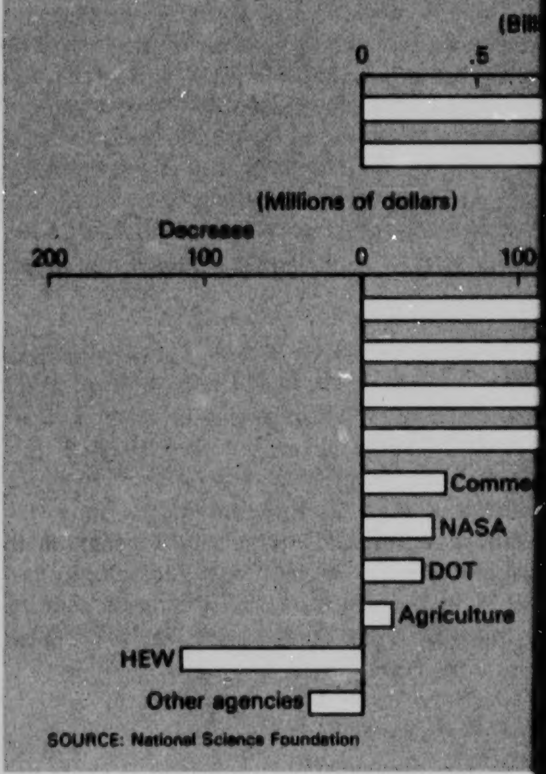


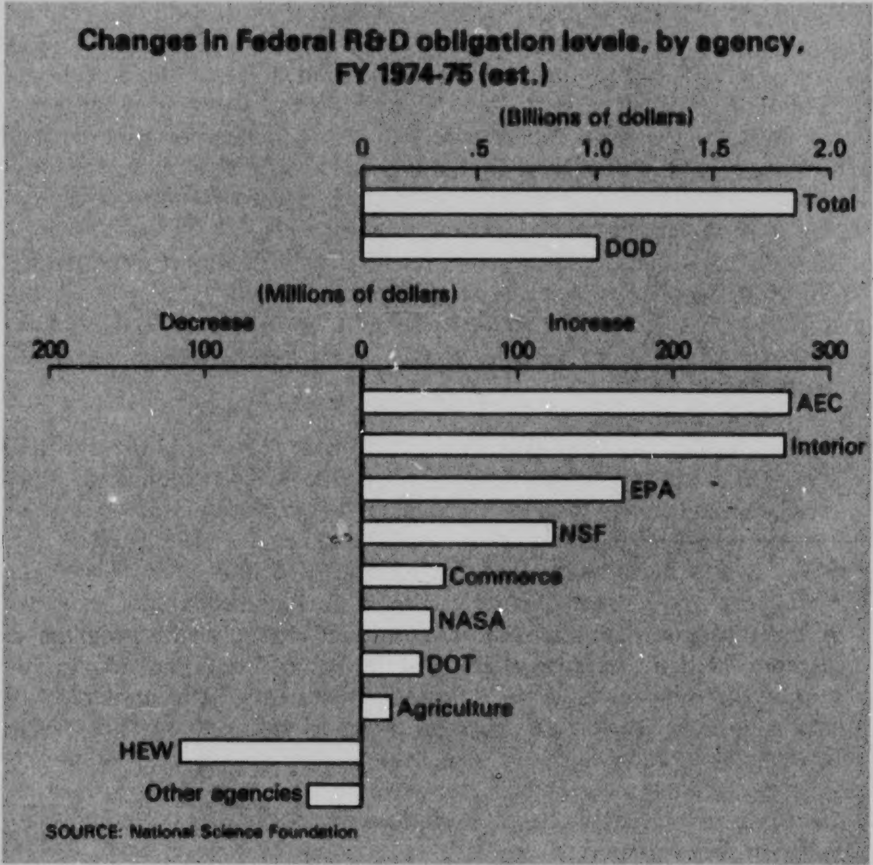
SOURCE: National Science Foundation

for 1975 is second only to that for DOD
of the overall R&D obligational total
le from relatively small increases for
d for naval reactor development, the
ed to energy work. The 1973 fuel crisis
nal energy program in which the R&D
central role. Civilian reactor develop-
program with chief activity focused on
reactor. Gas cooled and molten salt
vere also expanded as was general
ighest relative gain for any program in
olled thermonuclear fusion research.

NSF was brought about by the same
vel. In 1975 the share of NSF in the
ated 3 percent. The growth for NSF is
es for basic research project support
Applied to National Needs) program.
ort of basic research are to encourage
tribute to energy self-sufficiency, and
e directed to research on solar and
nergy research and technology effort
e, systems, and resources, advanced
rgy and fuel transportation projects).

1 million for 1975 is the third highest
st relatively of any agency, at 95 per-
growth can be attributed to energy-
n fossil fuels is primarily an Interior
one-half of the Interior increase for
the Office of Coal Research on coal
ct combustion, and advanced power
f Mines on coal, petroleum, and oil
n, the Office of the Secretary has ex-
1975 on underground electric trans-
and mined area protection, and the
as a new research program on the
response to energy needs, the mining
reau of Mines has a large planned
al Survey for mineral resources sur-
l projects.

- The Department of Agriculture (USDA) was expected to receive a small increase in funding in 1975. This will reflect the continuing research programs of the Agricultural Research Service and the Cooperative State Research Service. These cover production, marketing, and use of agricultural products and research at agricultural experiment stations.



Changes in Federal R&D obligation levels, by agency, FY 1974-75 (est.)

SOURCE: National Science Foundation

- The Department of Transportation (DOT) reported a planned increase of 11 percent in 1975. The largest program increase was for railroad research. Two programs where expansion was directly related to the energy program were the energy conservation program of the Office of the Secretary and the pollution control program of the Coast Guard concerned with spillage and waste. Other increased R&D programs were for urban mass transportation, highway safety, and multimodal studies.

- The $169 million increase for EPA in 1975 is totally related to the energy program. This 97-percent rise in environmental R&D efforts is the greatest relative rise for any agency. Almost all of the added funding was placed under the broad heading of energy-related environmental R&D programs. These were to be carried out by EPA in both a coordinating and operating capacity. EPA planned to transfer much of these funds to other agencies for energy-related environmental work with the rest being used by EPA for specific R&D projects under its own direction.

- A 25-percent increase for the Department of Commerce is primarily the result of the addition of two new programs in 1975: the National Bureau of Fire Prevention and the former community development program of the Office of Economic Opportunity (OEO), which was transferred to the Commerce Office of Minority Business Enterprise. Other Commerce programs were maintained on about the same level or increased slightly, for example, those of the National Oceanic and Atmospheric Administration (NOAA) and the National Bureau of Standards (NBS).

- The 24 other Federal agencies reporting R&D activities in the current (1973-75) period included OEO until 1974, after which time that agency was terminated. Its remaining R&D programs were transferred to other agencies. Aside from the absence of any funding for OEO in 1975, R&D activities of the Special Action Office for Drug Abuse Prevention were steeply reduced. On the other hand, the R&D programs of the Veterans Administration (VA) and the Department of Housing and Urban Development (HUD) were raised significantly: VA for further work on veterans health problems and HUD for activities related to energy systems and community development, cash assistance, and other programs. The Department of Justice reported a slight increase to cover crime prevention and control R&D programs and the Department of State planned an increase in Agency for International Development programs.

Performers

- In 1975 an estimated 73 percent of t
billion, will be placed in the form of gra
mural performers. The remaining $5.3
obligated intramurally for work by Fede

INDUSTRY

- Industrial firms were scheduled fo
1975 to a level that would be one of the h
a share of all Federal research and devel
(including FFRDC's)[7] was expected to re
the 66 percent peak in 1963. Most of
centered on development programs.

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[7] Federally Funded Research and Development Cente

Federal obligations for research and

[Dollars in mill

Performer	Actual
	1973
Total	$16,821
Federal intramural	4,619
Industrial firms	7,874
FFRDC's[1] administered by industrial firms	582
Universities and colleges	1,916
FFRDC's[1] administered by universities	725
Other nonprofit institutions	601
FFRDC's[1] administered by nonprofit institutions	183
State and local governments	257
Foreign performers	64

[1] Federally Funded Research and Development Centers.

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operating capacity. EPA planned to trans-
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rest being used by EPA for specific R&D
ection.

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and community development, cash assis-
s. The Department of Justice reported a
me prevention and control R&D programs
e planned an increase in Agency for Inter-
rams.

Performers

- In 1975 an estimated 73 percent of the Federal R&D total, or $14.3 billion, will be placed in the form of grants and contracts with extramural performers. The remaining $5.3 billion, or 27 percent, will be obligated intramurally for work by Federal personnel.

INDUSTRY

- Industrial firms were scheduled for a decided rise in funding in 1975 to a level that would be one of the highest on record. However, as a share of all Federal research and development performed, this sector (including FFRDC's)[7] was expected to represent 51 percent, well below the 66 percent peak in 1963. Most of the industry effort has been centered on development programs.

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[7] Federally Funded Research and Development Centers.

Federal obligations for research and development, by performer

[Dollars in millions]

Performer	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$16,821	$17,743	+ 5.5	$19,597	+ 10.4
Federal intramural	4,619	4,940	+ 6.9	5,267	+ 6.6
Industrial firms	7,874	7,987	+ 1.4	9,311	+ 16.6
FFRDC's[1] administered by industrial firms	582	584	+ .3	634	+ 8.4
Universities and colleges	1,916	2,226	+ 16.2	2,296	+ 3.1
FFRDC's[1] administered by universities	725	782	+ 7.8	886	+ 13.3
Other nonprofit institutions	601	720	+ 19.9	698	− 3.2
FFRDC's[1] administered by nonprofit institutions	183	188	+ 2.6	209	+ 11.4
State and local governments	257	243	− 5.6	228	− 6.1
Foreign performers	64	73	+ 13.8	69	− 5.9

[1] Federally Funded Research and Development Centers.

- The 1975 increase in planned use of industrial capability was brought about largely by expected expansion of a number of DOD programs on the part of all three services and by plans for sharply stepped up energy R&D programs under the management of AEC, EPA, and Interior (notably the Bureau of Mines, the Office of Coal Research, and the Office of the Secretary.)[8]

- Aside from the effect of energy programs, three agencies have continued to account for more than nine out of 10 dollars of Federal support to industrial firms for the entire 1965-75 decade. These are DOD, NASA, and AEC, in that order. Although NASA support to industry has been declining in recent years, little change is expected to occur between 1974 and 1975; in fact, a very slight increase is indicated.

INTRAMURAL

- Between 1965 and 1975 the Federal intramural sector reflects a steady rise in funding and is the only performing sector with no decline in support in any year. Federal intramural activities cover costs associated with the administration of extramural programs by Federal personnel as well as all other costs connected with intramural R&D performance. Intramural performance has been fairly evenly divided between research and development, although in 1975 greater weight is expected to be placed on the research end of the spectrum.

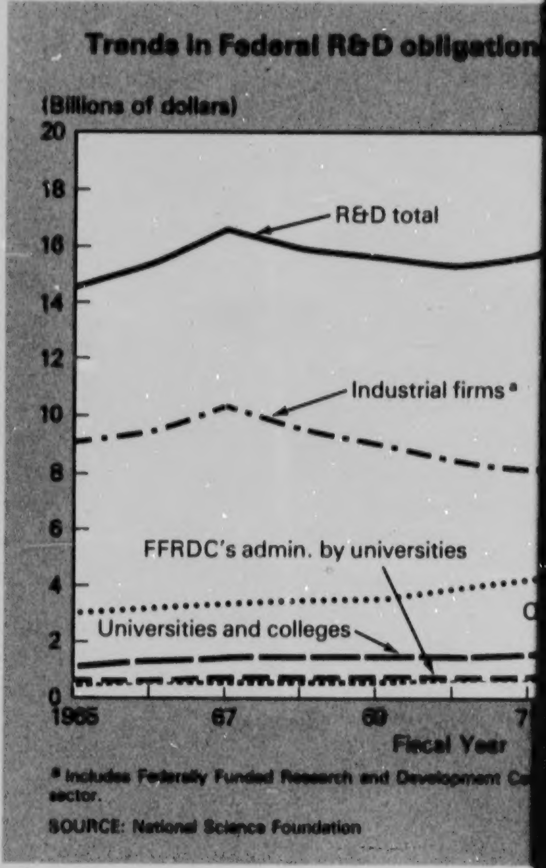
- The share of intramural work in total Federal R&D activities has been growing. Between 1965 and 1969 it ranged between 21 percent and 22 percent. Between 1970 and 1975 the range is 25 percent to 28 percent.

- Since 1969 DOD and NASA have provided approximately three-fourths of the support to Federal intramural performance, and in earlier years the share was even larger. Thus, the funding of these agencies has the most effect on the overall intramural support trend. The agencies that make up most of the rest of the intramural total are HEW, USDA, Interior, and Commerce, and this pattern has prevailed for many years. A gradual tendency is discernible for the non-DOD/NASA group to assume an increasing share of the intramural total.

UNIVERSITIES AND CO

- Agency use of universities and college grown almost continuously in the 1965-75 1970. However, growth has been une Approximately one-half of the effort of this research and most of the rest to applied re

- The share of the university-and-college total has risen more steeply than the i universities and colleges accounted for 8 pe R&D program effort, and by 1975 they were percent.



a Includes Federally Funded Research and Development C sector.

SOURCE: National Science Foundation

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[8] In October 1974 the President signed P.L. 93-438, transferring the AEC and Interior programs to the newly established Energy Research and Development Administration.

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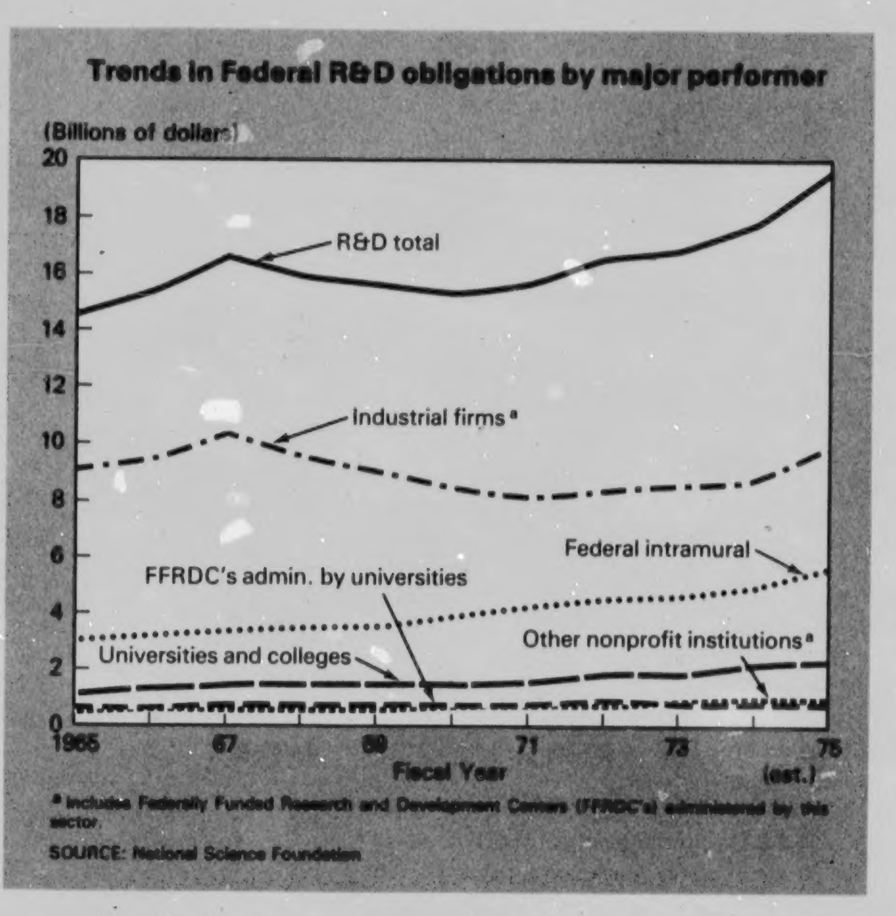
ransferring the AEC and Interior programs to pment Administration.

UNIVERSITIES AND COLLEGES

- Agency use of universities and colleges for R&D performance has grown almost continuously in the 1965-75 period with a drop only in 1970. However, growth has been uneven from year to year. Approximately one-half of the effort of this sector is devoted to basic research and most of the rest to applied research.

- The share of the university-and-college sector in the Federal R&D total has risen more steeply than the intramural share. In 1965 universities and colleges accounted for 8 percent of the entire Federal R&D program effort, and by 1975 they were expected to account for 12 percent.



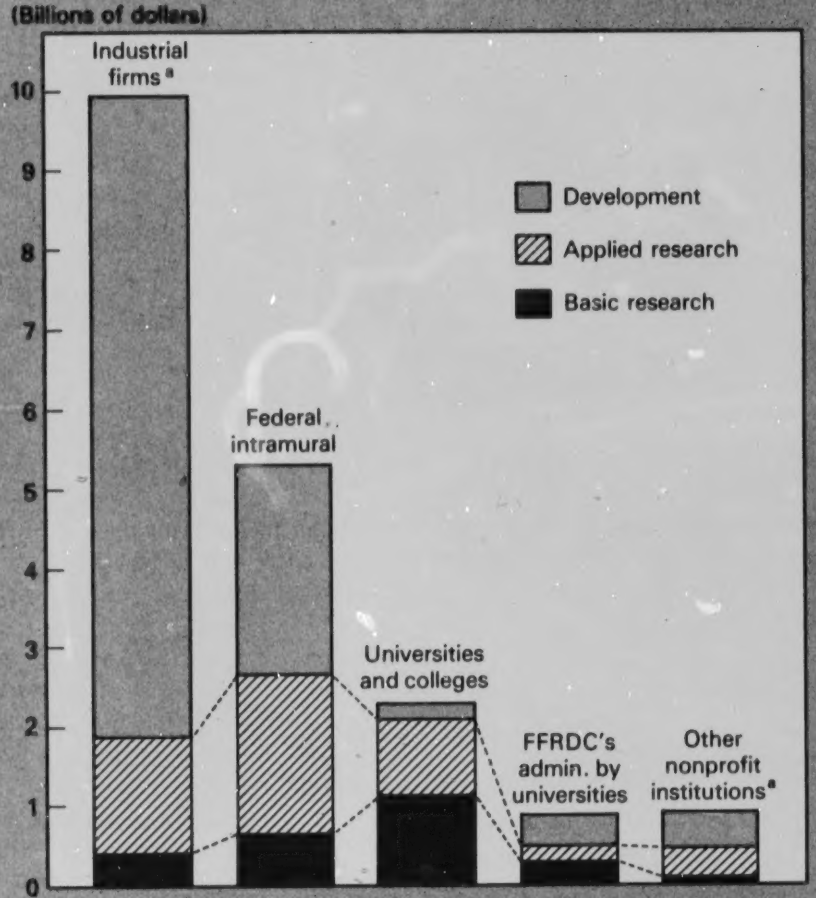
Trends in Federal R&D obligations by major performer

a Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

SOURCE: National Science Foundation

• The agencies that have primarily contributed to the increase in university-and-college support are HEW and NSF. They have made up for decreased support on the part of DOD and NASA, the other chief support agencies until 1975. For 1975 DOD is still the third agency in size of funds to the university-and-college sector, but AEC and USDA have moved up into fourth and fifth places, as NASA has declined.

Federal obligations for research and development, by performer and character of work, FY 1975 (est.)



[a] Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

SOURCE: National Science Foundation

Research by Fields

• An addition to the survey for this re on research performed at universitie science.[9] The survey covered the six r accounted for more than 90 percent o sector: HEW, NSF, DOD, AEC, USDA, a were $1.6 billion for 1973, almost $1.9 $1.9 billion for 1975.

• In each year the life sciences mad total — 55 percent in 1975. Next in ord sciences — astronomy, chemistry, phys was expected to account for 8 percen sciences — atmospheric, geological, biological sciences) — were expected social sciences were to receive an es mathematics, an estimated 3 percent; percent.

• Some agencies are closely connecte e.g., HEW with support of the life scie 1975) and psychology (three out of five of the environmental sciences (three ou sciences NSF is expected to provide o AEC, one-fifth. In the case of both ma and DOD will each provide two out of fi HEW will provide almost one-half the one-third.

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[9] For a further analysis of basic research and ap separately, see sections 3 and 4.

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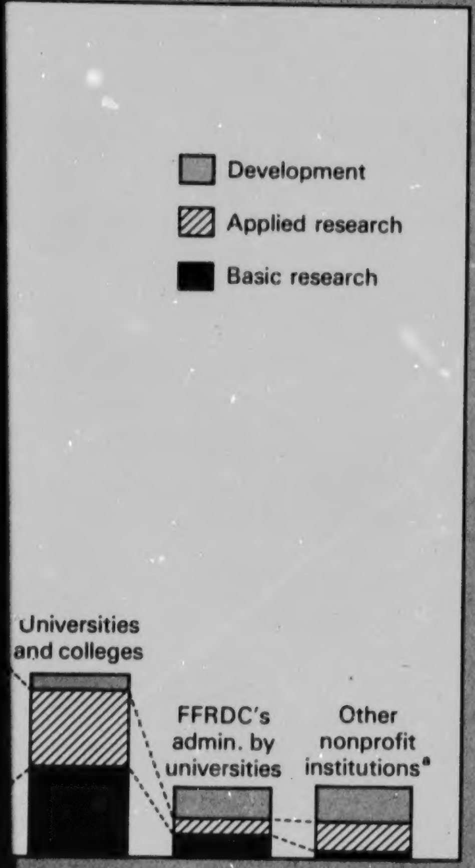

Development Centers (FFRDC's) administered by this

Research by Fields of Science

- An addition to the survey for this report was the collection of data on research performed at universities and colleges by fields of science.[9] The survey covered the six research support agencies that accounted for more than 90 percent of the Federal funding for this sector: HEW, NSF, DOD, AEC, USDA, and NASA. The totals reported were $1.6 billion for 1973, almost $1.9 billion for 1974, and just over $1.9 billion for 1975.

- In each year the life sciences made up more than one-half of the total — 55 percent in 1975. Next in order was support to the physical sciences — astronomy, chemistry, physics — 15 percent. Engineering was expected to account for 8 percent in 1975. The environmental sciences — atmospheric, geological, and oceanography (excluding biological sciences) — were expected to account for 7 percent. The social sciences were to receive an estimated 6 percent of the total; mathematics, an estimated 3 percent; and psychology, an estimated 3 percent.

- Some agencies are closely connected with support of certain fields; e.g., HEW with support of the life sciences (four out of five dollars in 1975) and psychology (three out of five dollars), and NSF with support of the environmental sciences (three out of five dollars). In the physical sciences NSF is expected to provide one-half the support in 1975 and AEC, one-fifth. In the case of both mathematics and engineering NSF and DOD will each provide two out of five dollars. In the social sciences HEW will provide almost one-half the support, and NSF will provide one-third.

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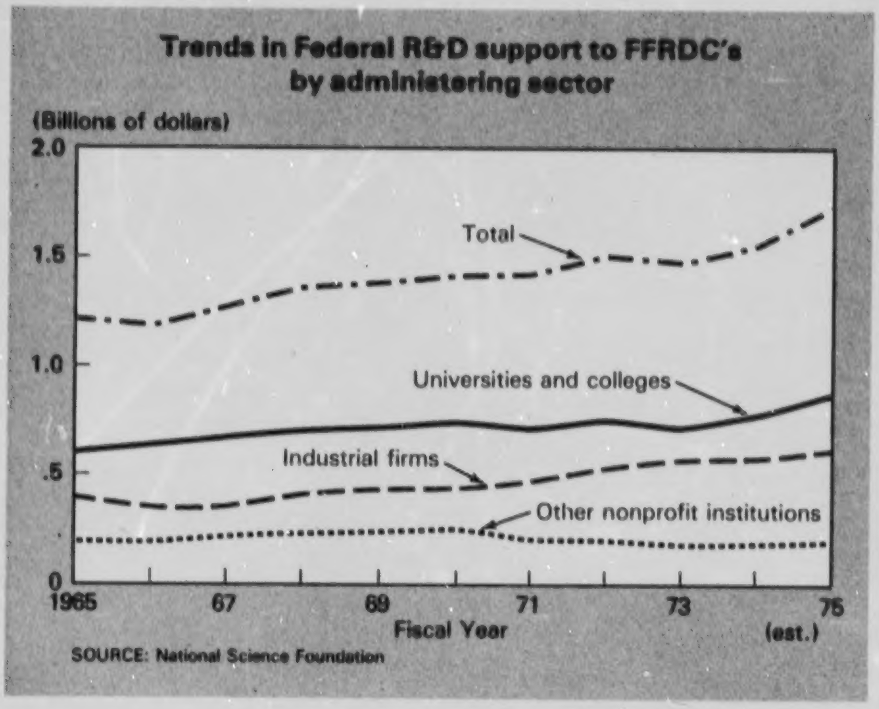
[9] For a further analysis of basic research and applied research performance, each treated separately, see sections 3 and 4.

FFRDC's

Federally Funded Research and Development Centers (FFRDC's) are R&D-performing or-managing organizations exclusively or substantially financed by one or more Federal agencies and administered for them by industry, universities, or other nonprofit institutions. AEC is the principal support agency. Since it operates almost no laboratories of its own, AEC places most of its R&D funds in FFRDC's—an estimated 72 percent in 1975.

- As a share of all Federal work carried out by FFRDC's, that done for AEC is expected to amount to 71 percent of the 1975 total and that done for DOD to amount to 19 percent. Next in order is the work performed for NASA, an estimated 5 percent in 1975.
- Over the 1965-75 decade Federal R&D performance by FFRDC's has continued to rise. The increase was greatest for those administered by industrial firms even though work by university-administered FFRDC's has remained the most extensive.



Trends in Federal R&D support to FFRDC's by administering sector

SOURCE: National Science Foundation

Federal R&D obligations to FFRDC's[1] by admi
fiscal year 1975 (est.

[Dollars in millions]

Sector	All agencies	AEC	DOD	NASA
Total.......	$1,728.8	$1,223.6	$329.2	$89.1
Industrial firms	633.5	627.3	.5	.1
Universities and colleges	886.0	566.0	181.6	87.7
Other nonprofit institutions..	209.3	30.3	147.1	1.3

[1] Federally Funded Research and Development Centers.

OTHER NONPROFI

- Between 1965 and 1975 the share of th
undertaken by other nonprofit institutions
from 4 percent to almost 5 percent. HEW a
support agencies.

STATE AND LOCAL GOVER

- Agencies of State and local governm
accomplish only 1.1 percent of the R&D activ
1975. The significance of this sector lies not
rapid growth. Estimates for 1974 and 1975 ar
reduced funding from HEW (the National Ins
Office of Education) and from EPA.

FFRDC's

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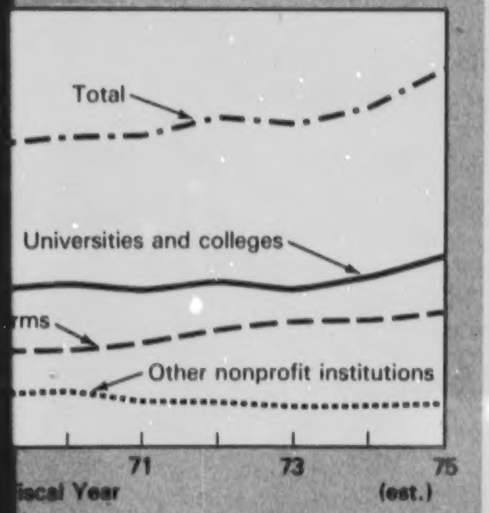
R&D support to FFRDC's nistering sector



Federal R&D obligations to FFRDC's[1] by administering sector and agency, fiscal year 1975 (est.)

[Dollars in millions]

Sector	All agencies	AEC	DOD	NASA	NSF	HEW	Other
Total	$1,728.8	$1,223.6	$329.2	$89.1	$46.1	$3.1	$37.7
Industrial firms	633.5	627.3	.5	.1	5.3	–	.3
Universities and colleges	886.0	566.0	181.6	87.7	40.8	1.4	8.5
Other nonprofit institutions..	209.3	30.3	147.1	1.3	–	1.7	28.9

[1] Federally Funded Research and Development Centers.

OTHER NONPROFIT

- Between 1965 and 1975 the share of the total Federal R&D effort undertaken by other nonprofit institutions (including FFRDC's) rose from 4 percent to almost 5 percent. HEW and DOD are the principal support agencies.

STATE AND LOCAL GOVERNMENTS

- Agencies of State and local governments were scheduled to accomplish only 1.1 percent of the R&D activities of Federal agencies in 1975. The significance of this sector lies not in its size but in its recent rapid growth. Estimates for 1974 and 1975 are down, however, owing to reduced funding from HEW (the National Institute of Education and the Office of Education) and from EPA.

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.)

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development				Basic research		Applied research		Development
			Character of work (percent distribution)			Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)
			Basic research	Applied research	Development						
Department of Agriculture, total	$405.9	4	39	58	4	73 Intra. 24 Univ.	69 Life 14 Phy Sci. 9 Soc.	72 Intra. 25 Univ.	58 Life 15 Soc. 13 Phy Sci. 11 Eng.	72 Intra. 26 Univ.	98 Intra.
Agricultural Research Service	218.8	–	42	53	5	95 Intra.	73 Life 20 Phy Sci.	94 Intra.	61 Life 21 Phy Sci. 16 Eng.	95 Intra.	97 Intra.
Cooperative State Research Service	98.6	–	38	62	–	96 Univ.	69 Life 22 Soc.	96 Univ.	69 Life 22 Soc.	96 Univ.	–
Economic Research Service	20.9	–	28	72	–	97 Intra.	100 Soc.	97 Intra.	100 Soc.	97 Intra.	–
Farmer Cooperative Service	1.4	–	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
Forest Service	65.2	–	32	63	5	95 Intra.	68 Life 11 Phy Sci. 10 Eng. 9 Environ.	89 Intra.	56 Life 15 Eng. 11 Soc.	97 Intra.	100 Intra.
National Agricultural Library	.1	–	–	100	–	93 Univ.	–	–	100 Other	93 Univ.	–
Statistical Reporting Service	.8	–	2	62	36	94 Intra.	100 Math.	100 Univ.	100 Math.	94 Intra.	100 Intra.
Department of Commerce, total	262.8	15	8	51	42	53 Intra. 17 Ind. 16 N.P. 10 Univ.	63 Environ. 20 Phy Sci. 14 Eng.	74 Intra. 17 Univ. 8 Ind.	31 Life 26 Environ. 19 Eng. 16 Phy Sci.	65 Intra. 16 Univ. 13 Ind.	36 Intra. 36 N.P. 24 Ind.
Economic Development Administration	1.6	–	–	16	84	31 S & L gov't 30 N.P. 19 Univ. 14 Intra.	–	–	100 Soc.	56 Univ. 29 Ind. 16 Intra.	37 S & L gov't 36 N.P. 14 Intra. 12 Univ.
Maritime Administration	28.6	–	6	19	75	78 Ind. 21 Intra.	100 Eng.	82 Ind. 13 Intra.	94 Eng.	76 Ind. 21 Intra.	78 Ind. 22 Intra.
National Bureau of Fire Prevention	5.6	–	8	25	67	69 Intra. 31 Univ.	100 Other	95 Univ.	100 Other	100 Intra.	66 Intra. 34 Univ.
National Bureau of Standards	48.4	–	10	68	22	93 Intra.	82 Phy Sci. 18 Eng.	90 Intra. 9 Univ.	54 Phy Sci. 41 Eng.	97 Intra.	81 Intra. 19 Ind.
National Oceanic and Atmospheric Administration	135.3	–	9	68	23	60 Intra. 17 Univ. 15 Ind.	100 Environ.	80 Intra. 18 Univ.	45 Life 38 Environ.	55 Intra. 23 Univ. 14 Ind.	69 Intra. 24 Ind.
Office of Minority Business Enterprise	39.3	–	–	(3)	100	99 N.P.	–	–	100 Soc.	100 Intra.	99 N.P.
Office of Telecommunications	1.3	–	–	50	50	100 Intra.	–	–	100 Eng.	100 Intra.	100 Intra.
Patent Office	.8	–	–	–	100	100 Intra.	–	–	–	–	100 Intra.
Social and Economic Statistics Administration	1.0	–	18	36	46	90 Intra. 10 Univ.	58 Math. 36 Psych.	58 Univ. 42 Intra.	71 Soc. 16 Psych. 13 Math.	100 Intra.	100 Intra.
U.S. Travel Service	.9	–	–	48	52	61 Ind. 23 Intra. 17 For.	–	–	100 Soc.	62 Ind. 22 Intra. 16 For.	59 Ind. 23 Intra. 17 For.
Department of Defense, total	9,807.9	10	3	17	81	64 Ind. 29 Intra.	30 Eng. 22 Phy Sci. 22 Environ. 11 Life. 10 Math.	42 Univ. 41 Intra. 13 Ind.	69 Eng. 11 Phy Sci.	46 Ind. 44 Intra.	70 Ind. 25 Intra.

80

Cooperative State Research Service	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 22 Soc.	[illegible]	[illegible] 22 Soc.	[illegible]	[illegible]
Economic Research Service	20.9	–	28	72	–	97 Intra.	100 Soc.	97 Intra.	100 Soc.	97 Intra.	–
Farmer Cooperative Service	1.4	–	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
Forest Service	65.2	–	32	63	5	95 Intra.	68 Life 11 Phy Sci. 10 Eng. 9 Environ.	89 Intra.	56 Life 15 Eng. 11 Soc.	97 Intra.	100 Intra.
National Agricultural Library	.1	–	–	100	–	93 Univ.	–	–	100 Other	93 Univ.	–
Statistical Reporting Service	.8	–	2	62	36	94 Intra.	100 Math.	100 Univ.	100 Math.	94 Intra.	100 Intra.
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Maritime Administration	28.6	–	6	19	75	78 Ind. 21 Intra.	100 Eng.	82 Ind. 13 Intra.	94 Eng.	76 Ind. 21 Intra.	78 Ind. 22 Intra.
National Bureau of Fire Prevention	5.6	–	8	25	67	69 Intra. 31 Univ.	100 Other	95 Univ.	100 Other	100 Intra.	66 Intra. 34 Univ.
National Bureau of Standards	48.4	–	10	68	22	93 Intra.	82 Phy Sci. 18 Eng.	90 Intra. 9 Univ.	54 Phy Sci. 41 Eng.	97 Intra.	81 Intra. 19 Ind.
National Oceanic and Atmospheric Administration	135.3	–	9	68	23	60 Intra. 17 Univ. 15 Ind.	100 Environ.	80 Intra. 18 Univ.	45 Life 38 Environ.	55 Intra. 23 Univ. 14 Ind.	69 Intra. 24 Ind.
Office of Minority Business Enterprise	39.3	–	–	(3)	100	99 N.P.	–	–	100 Soc.	100 Intra.	99 N.P.
Office of Telecommunications	1.3	–	–	50	50	100 Intra.	–	–	100 Eng.	100 Intra.	100 Intra.
Patent Office	.8	–	–	–	100	100 Intra.	–	–	–	–	100 Intra.
Social and Economic Statistics Administration	1.0	–	18	36	46	90 Intra. 10 Univ.	58 Math. 36 Psych.	58 Univ. 42 Intra.	71 Soc. 16 Psych. 13 Math.	100 Intra.	100 Intra.
U.S. Travel Service	.9	–	–	48	52	61 Ind. 23 Intra. 17 For.	–	–	100 Soc.	62 Ind. 22 Intra. 16 For.	59 Ind. 23 Intra. 17 For.
Department of Defense, total	9,807.9	10	3	17	81	64 Ind. 29 Intra.	30 Eng. 22 Phy Sci. 22 Environ. 11 Life. 10 Math.	42 Univ. 41 Intra. 13 Ind.	69 Eng. 11 Phy Sci.	46 Ind. 44 Intra.	70 Ind. 25 Intra.
Department of the Army	2,087.9	–	2	14	84	59 Ind. 37 Intra.	38 Life 22 Eng. 20 Phy Sci. 9 Environ.	59 Intra. 31 Univ.	53 Eng. 18 Phy Sci. 17 Life	79 Intra. 15 Ind.	68 Ind. 30 Intra.
Department of the Navy	3,296.5	–	3	7	91	65 Ind. 28 Intra.	33 Environ. 29 Phy Sci. 16 Eng. 12 Life	54 Univ. 34 Intra. 10 Ind.	58 Eng. 19 Phy Sci. 11 Math.	69 Intra. 17 Ind. 8 Univ. FFRDC	70 Ind. 25 Intra.
Department of the Air Force	3,700.2	–	2	21	76	69 Ind. 24 Intra.	40 Eng. 26 Environ. 23 Phy Sci.	52 Intra. 37 Univ. 9 Ind.	90 Eng.	63 Ind. 31 Intra.	73 Ind. 21 Intra.
Defense Agencies	516.3	–	8	62	30	51 Ind. 30 Intra.	48 Eng. 33 Math. 9 Phy Sci.	41 Univ. 41 Ind. 10 Intra.	41 Eng. 21 Phy Sci. 15 Other 13 Environ.	51 Ind. 28 Intra.	51 Ind. 41 Intra.

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.) — Continued

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development				Basic research		Applied research		Development
			Character of work (percent distribution)			Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)
			Basic research	Applied research	Development						
Departmentwide Funds	3.0	–	–	100	–	35 Ind. 25 N.P. 15 Intra. 12 Univ. 9 N.P. FFRDC	–	–	31 Eng. 17 Phy Sci. 17 Other 13 Life 9 Math. 8 Soc.	35 Ind. 25 N.P. 15 Intra. 12 Univ. 9 N.P. FFRDC	–
Director of Test and Evaluation	24.1	–	–	–	100	73 Intra. 18 Ind. 8 N.P. FFRDC	–	–	–	–	73 Intra. 18 Ind. 8 N.P. FFRDC
Department of Health, Education, and Welfare, total	2,232.5	2	24	56	19	52 Univ. 20 Intra. 17 N.P.	80 Life 8 Soc.	73 Univ. 13 Intra. 10 N.P.	82 Life 9 Soc.	48 Univ. 25 Intra. 15 N.P.	37 Univ. 32 N.P. 14 Intra. 11 Ind.
Alcohol, Drug Abuse, and Mental Health Administration	131.1	–	43	57	–	52 Univ. 18 Intra. 14 N.P. 13 S & L gov't	43 Psych. 38 Life 17 Soc.	60 Univ. 27 Intra.	62 Life 20 Psych. 17 Soc.	47 Univ. 20 N.P. 19 S & L gov't 12 Intra.	–
Center for Disease Control	36.6	–	–	99	1	78 Intra. 8 For. 8 Univ.	–	–	96 Life	78 Intra. 8 For.	82 Univ. 18 Ind.
Food and Drug Administration	40.4	–	–	100	–	46 Intra. 35 Univ.	–	–	100 Life	46 Intra. 35 Univ.	–
Health Resources Administration	57.2	–	16	7	77	32 Univ. 22 N.P. 19 Intra. 12 Ind. 10 S & L gov't	67 Soc. 33 Life	56 Univ. 33 N.P. 11 For.	50 Other 50 Soc.	37 Ind. 32 Intra. 24 For.	31 Univ. 22 N.P. 21 Intra. 12 Ind. 12 S & L gov't
Health Services Administration	16.2	–	24	56	19	28 Univ. 27 Intra. 22 For. 13 N.P. 8 Ind.	100 Life	91 For. 9 Intra.	97 Life	46 Univ. 34 Intra. 19 N.P.	44 Ind. 32 Intra. 12 N.P. 12 Univ.
National Institute of Education	130.0	–	15	8	77	54 N.P. 32 Univ. 9 Intra.	100 Soc.	48 Univ. 43 N.P. 10 Intra.	100 Soc.	58 N.P. 39 Univ.	56 N.P. 29 Univ. 10 Intra.
National Institutes of Health	1,666.2	–	27	58	15	59 Univ. 19 Intra. 14 N.P.	91 Life	78 Univ. 12 Intra. 9 N.P.	90 Life	53 Univ. 23 Intra. 15 N.P.	45 Univ. 20 N.P. 15 Ind. 15 Intra.
Office of Education	15.5	–	(3)	37	62	58 Univ. 30 N.P. 9 S & L gov't	100 Soc.	77 Univ. 23 Intra.	100 Soc.	68 Univ. 18 N.P. 9 S & L gov't	52 Univ. 37 N.P. 9 S & L gov't
Office of Human Development	44.0	–	–	38	62	55 N.P. 18 Intra. 14 Univ. 11 S & L gov't	–	–	65 Soc. 21 Psych. 14 Life	37 Univ. 36 N.P. 21 Intra.	66 N.P. 18 S & L gov't 16 Intra.
Office of the Secretary	33.7	–	14	86	–	36 S & L gov't 27 N.P. 16 Univ. 12 Intra.	100 Soc.	36 S & L gov't 27 N.P. 16 Univ. 12 Intra. 9 Ind.	100 Soc.	36 S & L gov't	–

											11 Ind.
Alcohol, Drug Abuse, and Mental Health Administration	131.1	–	43	57	–	52 Univ. 18 Intra. 14 N.P. 13 S & L gov't	43 Psych. 38 Life 17 Soc.	60 Univ. 27 Intra.	62 Life 20 Psych. 17 Soc.	47 Univ. 20 N.P. 12 S & L gov't 12 Intra.	–
Center for Disease Control	36.6	–	–	99	1	78 Intra. 8 For. 8 Univ.	–	–	95 Life	78 Intra. 8 For.	82 Univ. 18 Ind.
Food and Drug Administration	40.4	–	–	100	–	46 Intra. 35 Univ.	–	–	100 Life	46 Intra. 35 Univ.	–
Health Resources Administration	57.2	–	16	7	77	32 Univ. 22 N.P. 19 Intra. 12 Ind. 10 S & L gov't	67 Soc. 33 Life	56 Univ. 33 N.P. 11 For.	50 Other 50 Soc.	37 Ind. 32 Intra. 24 For.	31 Univ. 22 N.P. 21 Intra. 12 Ind. 12 S & L gov't
Health Services Administration	16.2	–	24	56	19	28 Univ. 27 Intra. 22 For. 13 N.P. 8 Ind.	100 Life	91 For. 9 Intra.	97 Life	46 Univ. 34 Intra. 19 N.P.	44 Ind. 32 Intra. 12 N.P. 12 Univ.
National Institute of Education	130.0	–	15	8	77	54 N.P. 32 Univ. 9 Intra.	100 Soc.	48 Univ. 43 N.P. 10 Intra.	100 Soc.	58 N.P. 39 Univ.	55 N.P. 29 Univ. 10 Intra.
National Institutes of Health	1,666.2	–	27	58	15	59 Univ. 19 Intra. 14 N.P.	91 Life	78 Univ. 12 Intra. 9 N.P.	90 Life	53 Univ. 23 Intra. 15 N.P.	45 Univ. 20 N.P. 15 Ind. 15 Intra.
Office of Education	15.5	–	(3)	37	62	58 Univ. 30 N.P. 9 S & L gov't	100 Soc.	77 Univ. 23 Intra.	100 Soc.	68 Univ. 18 N.P. 9 S & L gov't	52 Univ. 37 N.P. 9 S & L gov't
Office of Human Development	44.9	–	–	38	62	55 N.P. 18 Intra. 14 Univ. 11 S & L gov't	–	–	65 Soc. 21 Psych. 14 Life	37 Univ. 36 N.P. 21 Intra.	66 N.P. 18 S & L gov't 16 Intra.
Office of the Secretary	33.7	–	14	86	–	36 S & L gov't 27 N.P. 16 Univ. 12 Intra.	100 Soc.	36 S & L gov't 27 N.P. 16 Univ. 12 Intra. 9 Ind.	100 Soc.	36 S & L gov't	–
Social and Rehabilitation Service	33.5	–	–	100	–	33 S & L gov't 32 Univ. 21 N.P. 11 For.	–	–	46 Life 43 Soc.	33 S & L gov't 32 Univ. 21 N.P. 11 For.	–
Social Security Administration	27.2	–	2	98	–	100 Intra.	100 Soc.	100 Intra.	100 Soc.	100 Intra.	–
Department of Housing and Urban Development	76.3	2	–	51	49	27 Ind. 24 Intra. 23 N.P. 16 S & L gov't	–	–	86 Soc. 9 Eng.	32 Intra. 23 N.P. 20 Ind. 13 N.P. FFRDC 8 S & L gov't	34 Ind. 25 S & L gov't 23 N.P. 16 Intra.

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.) – Continued

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development: Character of work (percent distribution): Basic research	Total research and development: Character of work (percent distribution): Applied research	Total research and development: Character of work (percent distribution): Development	Total research and development: Major performers[2] (percent of total)	Basic research: Major fields of science[2] (percent of total)	Basic research: Major performers[2] (percent of total)	Applied research: Major fields of science[2] (percent of total)	Applied research: Major performers[2] (percent of total)	Development: Major fields of science[2] (percent of total)
Department of the Interior, total	557.4	(3)	20	39	41	45 Ind. 40 Intra. 8 Univ.	76 Environ. 9 Life 9 Phy Sci.	80 Intra. 15 Univ.	70 Eng. 13 Life 10 Environ.	50 Intra. 28 Ind. 10 Univ.	82 Ind. 11 Intra.
Bonneville Power Administration	9.5	–	–	13	87	71 Ind. 28 Intra.	–	–	100 Eng.	75 Ind. 19 Intra.	70 Ind. 29 Intra.
Bureau of Land Management	10.4	–	–	100	(3)	50 Univ. 27 Intra. 23 Ind.	–	–	100 Life	50 Univ. 26 Intra. 23 Ind.	100 Intra.
Bureau of Mines	195.5	–	3	39	59	56 Ind. 41 Intra.	80 Phy Sci. 18 Eng.	91 Intra. 9 Univ.	80 Eng. 10 Phy Sci.	85 Intra. 9 Ind.	90 Ind. 10 Intra.
Bureau of Reclamation	6.6	–	1	93	6	60 Intra. 19 Ind. 13 Univ. 8 S & L gov't	100 Eng.	67 Univ. 33 Intra.	68 Environ. 30 Eng.	58 Intra. 20 Ind. 13 Univ. 8 S & L gov't	91 Intra.
Bureau of Sport Fisheries and Wildlife	29.6	–	33	51	16	70 Intra. 28 S & L gov't	100 Life	70 Intra. 26 S & L gov't	100 Life	61 Intra. 38 S & L gov't	100 Intra.
Geological Survey	102.9	–	84	15	1	87 Intra. 12 Univ.	93 Environ.	85 Intra. 14 Univ.	71 Environ. 16 Phy Sci. 10 Eng.	99 Intra.	66 Intra. 22 Ind. 13 Univ.
National Park Service	2.2	–	64	36	–	61 Univ. 39 Intra.	100 Soc.	57 Univ. 43 Intra.	100 Life	69 Univ. 31 Intra.	–
Office of Coal Research	138.1	–	2	35	63	68 Ind. 17 N.P. 9 Intra.	100 Eng.	93 Ind.	100 Eng.	48 Ind. 29 N.P. 18 Intra.	79 Ind. 10 N.P.
Office of the Secretary	50.8	–	–	72	28	71 Ind. 14 S & L gov't 12 Intra.	–	–	100 Eng.	68 Ind. 19 S & L gov't 11 Intra.	77 Ind. 15 Intra.
Office of Water Resources Research	11.8	–	24	76	–	79 Univ. 10 Ind.	45 Environ. 15 Life 13 Soc. 12 Eng. 8 Phy Sci.	79 Univ. 10 Ind.	35 Eng. 21 Environ. 19 Life 13 Soc.	79 Univ. 10 Ind.	–
Department of Justice, total	53.4	3	5	32	62	32 S & L gov't 18 N.P. FFRDC 13 Intra. 10 Univ.	100 Soc.	42 Univ. 32 N.P. 26 Intra.	65 Soc. 15 Other 10 Eng.	35 N.P. 27 S & L gov't 16 Univ. 9 N.P. FFRDC	32 S & L gov't 25 N.P. FFRDC 15 Intra. 8 Ind. 8 N.P.
Bureau of Prisons	.6	–	–	–	100	73 Intra. 17 Univ.	–	–	–	–	73 Intra. 19 Univ.
Drug Enforcement Administration	6.6	–	–	37	63	46 Ind. 23 N.P. FFRDC 14 Intra. 8 N.P.	–	–	39 Phy Sci. 28 Eng. 27 Life	49 Ind. 21 N.P. 19 Intra. 12 Univ.	44 Ind. 36 N.P. FFRDC 11 Intra. 9 Univ. FFRDC
Federal Bureau of Investigation	1.0	–	–	–	100	79 Ind. 21 Intra.	–	–	–	–	79 Ind. 21 Intra.

						23 Ind.				23 Ind.	
Bureau of Mines	195.5	–	3	38	59	58 Ind. 41 Intra.	80 Phy Sci. 18 Eng.	91 Intra. 9 Univ.	80 Eng. 10 Phy Sci.	85 Intra. 9 Ind.	90 Ind. 10 Intra.
Bureau of Reclamation	6.6	–	1	93	6	60 Intra. 19 Ind. 13 Univ. 8 S & L gov't	100 Eng.	67 Univ. 33 Intra.	66 Environ. 30 Eng.	58 Intra. 20 Ind. 13 Univ. 8 S & L gov't	91 Intra.
Bureau of Sport Fisheries and Wildlife	29.6		33	51	16	70 Intra. 28 S & L gov't	100 Life	70 Intra. 26 S & L gov't	100 Life	61 Intra. 38 S & L gov't	100 Intra.
Geological Survey	102.9	–	84	15	1	87 Intra. 12 Univ.	93 Environ.	85 Intra. 14 Univ.	71 Environ. 16 Phy Sci. 10 Eng.	99 Intra.	66 Intra. 22 Ind. 13 Univ.
National Park Service	2.2	–	64	36	–	61 Univ. 39 Intra.	100 Soc.	57 Univ. 43 Intra.	100 Life	69 Univ. 31 Intra.	–
Office of Coal Research	138.1	–	2	35	63	68 Ind. 17 N.P. 9 Intra.	100 Eng.	93 Ind.	100 Eng.	48 Ind. 29 N.P. 18 Intra.	79 Ind. 10 N.P.
Office of the Secretary	50.8	–	–	72	28	71 Ind. 14 S & L gov't 12 Intra.	–	–	100 Eng.	68 Ind. 19 S & L gov't 11 Intra.	77 Ind. 15 Intra.
Office of Water Resources Research	11.8	–	24	76	–	79 Univ. 10 Ind.	45 Environ. 15 Life 13 Soc. 12 Eng. 9 Phy Sci.	79 Univ. 10 Ind.	35 Eng. 21 Environ. 19 Life 13 Soc.	79 Univ. 10 Ind.	–
Department of Justice, total	53.4	3	5	32	62	32 S & L gov't 18 N.P. FFRDC 13 Intra. 10 Univ.	100 Soc.	42 Univ. 32 N.P. 26 Intra.	65 Soc. 15 Other 10 Eng.	35 N.P. 27 S & L gov't 16 Univ. 9 N.P. FFRDC	38 S & L gov't 25 N.P. FFRDC 15 Intra. 8 Ind. 8 N.P.
Bureau of Prisons	.6	–	–	–	100	73 Intra. 17 Univ.	–	–	–	–	73 Intra. 19 Univ.
Drug Enforcement Administration	6.6	–	–	37	63	46 Ind. 23 N.P. FFRDC 14 Intra. 8 N.P.	–	–	39 Phy Sci. 28 Eng. 27 Life	49 Ind. 21 N.P. 19 Intra. 12 Univ.	44 Ind. 36 N.P. FFRDC 11 Intra. 9 Univ. FFRDC
Federal Bureau of Investigation	1.0	–	–	–	100	79 Ind. 21 Intra.	–	–	–	–	79 Ind. 21 Intra.
Law Enforcement Assistance Administration	45.2	–	6	33	61	38 S & L gov't 20 N.P. 18 N.P. FFRDC 11 Intra. 11 Univ.	100 Soc.	42 Univ. 32 N.P. 26 Intra.	76 Soc. 17 Other	37 N.P. 32 S & L gov't 16 Univ. 11 N.P. FFRDC	46 S & L gov't 24 N.P. FFRDC 14 Intra. 9 N.P.
Department of Labor, total	21.6	(4)	8	66	26	37 Univ. 32 Intra. 11 N.P. 10 Ind. 8 S & L gov't	100 Soc.	47 Univ. 37 Intra. 9 N.P.	100 Soc.	38 Univ. 28 Intra. 12 Ind. 12 N.P. 9 S & L gov't	42 Intra. 33 Univ. 9 N.P. 9 S & L gov't

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.) — Continued

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development: Character of work (percent distribution): Basic research	Total research and development: Character of work (percent distribution): Applied research	Total research and development: Character of work (percent distribution): Development	Total research and development: Major performers[2] (percent of total)	Basic research: Major fields of science[2] (percent of total)	Basic research: Major performers[2] (percent of total)	Applied research: Major fields of science[2] (percent of total)	Applied research: Major performers[2] (percent of total)	Development: Major fields of science[2] (percent of total)
Bureau of Labor Statistics	2.3	–	–	30	70	100 Intra.	–	–	100 Soc.	100 Intra.	100 Intra.
Employment Standards Administration	.9	–	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	100 Intra.
Labor-Management Services Administration	1.2	–	100	–	–	48 Univ. 45 Intra.	100 Soc.	48 Univ. 45 Intra.	–	–	–
Manpower Administration	14.9	–	4	70	27	47 Univ. 18 Intra. 13 N.P. 12 S & L gov't 10 Ind.	100 Soc.	47 Univ. 18 Intra. 13 N.P. 12 S & L gov't 10 Ind.	100 Soc.	47 Univ. 18 Intra. 13 N.P. 12 S & L gov't 10 Ind.	47 Univ. 18 Intra. 13 N.P. 12 S & L gov't 10 Ind.
Occupational Safety and Health Administration	.8	–	–	100	–	75 Ind. 25 Intra.	–	–	100 Soc.	75 Ind. 25 Intra.	–
Office of the Secretary	1.5	–	–	100	–	32 Univ. 27 Intra. 22 N.P.	–	–	100 Soc.	32 Univ. 27 Intra. 22 N.P.	–
Department of State, total	31.6	4	–	90	10	45 Univ. 22 N.P. 16 For. 12 Intra.	–	–	44 Soc. 43 Life 12 Eng.	47 Univ. 19 N.P. 18 For. 12 Intra.	49 N.P. 21 Univ. 14 Intra. 12 Ind.
Departmental Funds	2.0	–	–	75	25	47 S & L gov't 24 Ind. 15 Intra. 8 N.P. FFRDC	–	–	44 Soc. 43 Life 12 Eng.	47 Univ. 19 N.P. 18 For. 12 Intra.	49 N.P. 21 Univ. 14 Intra. 12 Ind.
Agency for International Development	29.6	–	–	91	9	48 Univ. 23 N.P. 17 For. 12 Intra.	–	–	45 Life 41 Soc. 12 Eng.	50 Univ. 20 N.P. 19 For. 12 Intra.	59 N.P. 25 Univ. 12 Intra.
Department of Transportation, total	396.5	4	(4)	24	76	56 Ind. 18 Intra. 15 S & L gov't	79 Environ. 21 Eng.	80 Intra. 20 N.P. FFRDC	79 Eng. 10 Environ.	42 Ind. 25 Intra. 12 Univ. 10 S & L gov't	59 Ind. 16 S & L gov't 15 Intra.
Federal Aviation Administration	93.7	–	–	15	85	72 Ind. 17 Intra. 9 N.P. FFRDC	–	–	91 Eng.	67 Ind. 17 Intra. 10 N.P. FFRDC	73 Ind. 16 Intra. 8 N.P. FFRDC
Federal Highway Administration	42.7	–	–	8	92	52 S & L gov't 42 Ind.	–	–	97 Eng.	32 Univ. 29 Ind. 25 N.P. 8 Intra.	56 S & L gov't 43 Ind.
Federal Railroad Administration	53.5	–	–	43	57	60 Ind. 28 Intra.	–	–	98 Eng.	55 Ind. 29 Intra. 10 N.P. FFRDC	64 Ind. 27 Intra.
National Highway Traffic Safety Administration	56.9	–	–	40	60	45 Ind. 23 S & L gov't 16 Univ. 9 N.P.	–	–	75 Eng. 12 Math. 10 Life	40 Ind. 30 Univ. 15 N.P. 9 S & L gov't	49 Ind. 33 S & L gov't
Office of the Secretary	45.5	–	(4)	51	49	44 Intra. 23 Ind. 14 Univ.	100 Eng.	94 N.P. FFRDC	58 Eng. 32 Environ.	45 Intra. 20 Ind. 19 S & L	43 Intra. 27 Ind. 19 Univ.

						10 Ind.		10 Ind.		10 Ind.	10 Ind.
Occupational Safety and Health Administration	.8	–	–	100	–	75 Ind. 25 Intra.	–	–	100 Soc.	75 Ind. 25 Intra.	–
Office of the Secretary	1.5	–	–	100	–	32 Univ. 27 Intra. 22 N.P.	–	–	100 Soc.	32 Univ. 27 Intra. 22 N.P.	–
Department of State, total	31.6	4	–	90	10	45 Univ. 22 N.P. 16 For. 12 Intra.	–	–	44 Soc. 43 Life 12 Eng.	47 Univ. 19 N.P. 18 For. 12 Intra.	49 N.P. 21 Univ. 14 Intra. 12 Ind.
Departmental Funds	2.0	–	–	75	25	47 S & L gov't 24 Ind. 15 Intra. 8 N.P. FFRDC	–	–	44 Soc. 43 Life 12 Eng.	47 Univ. 19 N.P. 18 For. 12 Intra.	49 N.P. 21 Univ. 14 Intra. 12 Ind.
Agency for International Development	29.6	–	–	91	9	48 Univ. 23 N.P. 17 For. 12 Intra.	–	–	45 Life 41 Soc. 12 Eng.	50 Univ. 20 N.P. 19 For. 12 Intra.	59 N.P. 25 Univ. 12 Intra.
Department of Transportation, total	396.5	4	(4)	24	76	55 Ind. 18 Intra. 15 S & L gov't	79 Environ. 21 Eng.	80 Intra. 20 N.P. FFRDC	79 Eng. 10 Environ.	42 Ind. 25 Intra. 12 Univ. 10 S & L gov't	59 Ind. 16 S & L gov't 15 Intra.
Federal Aviation Administration	93.7	–	–	15	85	72 Ind. 17 Intra. 9 N.P. FFRDC	–	–	91 Eng.	67 Ind. 17 Intra. 10 N.P. FFRDC	73 Ind. 16 Intra. 8 N.P. FFRDC
Federal Highway Administration	42.7	–	–	8	92	52 S & L gov't 42 Ind.	–	–	97 Eng.	32 Univ. 29 Ind. 25 N.P. 8 Intra.	56 S & L gov't 43 Ind.
Federal Railroad Administration	53.5	–	–	43	57	60 Ind. 28 Intra.	–	–	98 Eng.	56 Ind. 29 Intra. 10 N.P. FFRDC	64 Ind. 27 Intra.
National Highway Traffic Safety Administration	56.9	–	–	40	60	45 Ind. 23 S & L gov't 16 Univ. 9 N.P.	–	–	75 Eng. 12 Math. 10 Life	40 Ind. 30 Univ. 15 N.P. 9 S & L gov't	49 Ind. 33 S & L gov't
Office of the Secretary	45.5	–	(4)	51	49	44 Intra. 23 Ind. 14 Univ. 12 S & L gov't	100 Eng.	94 N.P. FFRDC	58 Eng. 32 Environ.	45 Intra. 20 Ind. 19 S & L gov't 10 Univ.	43 Intra. 27 Ind. 19 Univ.
Coast Guard	30.6	–	1	20	79	66 Ind. 44 Intra. 12 Univ. FFRDC	100 Environ.	100 Intra.	60 Eng. 23 Environ. 12 Life	53 Ind. 20 Intra. 14 N.P. 12 Univ.	70 Ind. 15 Univ. FFRDC 11 Intra.
Urban Mass Transportation Administration	73.6	–	–	6	94	58 Ind. 22 S & L gov't 14 Intra.	–	–	91 Eng.	60 S & L gov't 26 Intra. 8 Univ. FFRDC	62 Ind. 20 S & L gov't 13 Intra.
Department of the Treasury, total	1.5	(4)	–	30	70	100 Intra.	–	–	96 Phy Sci.	100 Intra.	100 Intra.
Bureau of Engraving and Printing	1.5	–	–	30	70	100 Intra.	–	–	96 Phy Sci.	100 Intra.	100 Intra.

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.) — Continued

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development				Basic research		Applied research		Development
			Character of work (percent distribution)			Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)	Major performers[2] (percent of total)	Major fields of science[2] (percent of total)
			Basic research	Applied research	Development						
OTHER AGENCIES											
Action	.3	(4)	100	–	–	60 N.P. 30 S & L gov't 10 Intra.	100 Soc.	60 N.P. 30 S & L gov't 10 Intra.	–	–	–
Advisory Commission on Intergovernmental Relations	1.1	100	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
Atomic Energy Commission	1,703.9	56	19	13	68	37 Ind. FFRDC 33 Univ. FFRDC 20 Ind.	79 Phy Sci. 13 Life	64 Univ. FFRDC 22 Univ. 13 Ind. FFRDC	54 Phy Sci. 29 Life 12 Environ.	51 Univ. FFRDC 15 Ind. FFRDC 8 N.P. FFRDC	48 Ind. FFRDC 28 Ind. 21 Univ. FFRDC
Civil Aeronautics Board	.3	(4)	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
Civil Service Commission	4.3	(4)	16	20	64	65 Intra. 35 S & L gov't	100 Psych.	100 Intra.	100 Psych.	100 Intra.	54 S & L gov't 46 Intra.
Consumer Product Safety Commission	5.5	13	–	90	10	52 Intra. 48 Univ.	–	–	41 Soc. 40 Eng. 15 Life	51 Univ. 49 Intra.	78 Intra. 22 Univ.
Environmental Protection Agency	342.5	7	3	48	49	59 Ind. 25 Intra.	47 Life 36 Phy Sci. 9 Eng.	91 Univ.	41 Eng. 28 Phy. Sci. 18 Life 9 Environ.	65 Ind. 21 Intra.	56 Ind. 31 Intra.
Federal Communications Commission	1.5	3	–	100	–	69 Intra. 31 Ind.	–	–	54 Eng. 46 Soc.	69 Intra. 31 Ind.	–
Federal Home Loan Bank Board	.7	(3)	–	100	–	79 Intra. 21 Univ.	–	–	100 Soc.	100 Intra.	–
Federal Trade Commission	1.0	3	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
General Services Administration	16.6	(3)	(3)	7	93	95 Ind.	100 Eng.	92 Ind. 8 Intra.	90 Eng.	60 Ind. 36 N.P. FFRDC	98 Ind.
Library of Congress	2.8	3	–	54	46	98 Intra.	–	–	100 Other	100 Intra.	96 Intra.
National Aeronautics and Space Administration	3,071.2	94	21	26	53	60 Ind. 33 Intra.	56 Phy Sci. 26 Environ. 10 Life 8 Eng.	49 Ind. 36 Intra. 8 Univ. FFRDC	52 Eng. 31 Environ. 8 Phy Sci.	49 Intra. 44 Ind.	73 Ind. 24 Intra.
National Science Foundation	653.2	83	78	18	4	78 Univ.	28 Phy Sci. 19 Eng. 19 Environ. 18 Life	86 Univ.	30 Other 25 Eng. 16 Soc. 11 Environ. 9 Life	50 Univ. 27 Ind. 11 N.P.	50 Univ. 28 N.P. 19 Univ. FFRDC
Office of Telecommunications Policy	1.3	14	–	100	–	56 Ind. 24 Univ. 12 Intra. 8 Univ. FFRDC	–	–	57 Soc. 43 Eng.	56 Ind. 24 Univ. 12 Intra. 8 Univ. FFRDC	–
Small Business Administration	.2	(4)	–	100	–	57 Intra. 43 Univ.	–	–	100 Soc.	57 Intra. 43 Univ.	–

Atomic Energy Commission	1,703.9	56	19	13	68	37 Ind. FFRDC 33 Univ. FFRDC 20 Ind.	79 Phy Sci. 13 Life	64 Univ. FFRDC 22 Univ. 13 Ind. FFRDC	54 Phy Sci. 29 Life 12 Environ.	51 Univ. FFRDC 15 Ind. FFRDC 8 N.P. FFRDC	48 Ind. FFRDC 28 Ind. 21 Univ. FFRDC
Civil Aeronautics Board	.3	(4)	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
Civil Service Commission	4.3	(4)	16	20	64	65 Intra. 35 S & L gov't	100 Psych.	100 Intra.	100 Psych.	100 Intra.	54 S & L gov't 46 Intra.
Consumer Product Safety Commission	5.5	13	–	90	10	52 Intra. 48 Univ.	–	–	41 Soc. 40 Eng. 15 Life	51 Univ. 49 Intra.	78 Intra. 22 Univ.
Environmental Protection Agency	342.5	7	3	48	49	59 Ind. 25 Intra.	47 Life 36 Phy Sci. 9 Eng.	91 Univ.	41 Eng. 28 Phy. Sci. 18 Life 9 Environ.	65 Ind. 21 Intra.	56 Ind. 31 Intra.
Federal Communications Commission	1.5	3	–	100	–	69 Intra. 31 Ind.	–	–	54 Eng. 46 Soc.	69 Intra. 31 Ind.	–
Federal Home Loan Bank Board	.7	(3)	–	100	–	79 Intra. 21 Univ.	–	–	100 Soc.	100 Intra.	–
Federal Trade Commission	1.0	3	–	100	–	100 Intra.	–	–	100 Soc.	100 Intra.	–
General Services Administration	16.6	(3)	(3)	7	93	95 Ind.	100 Eng.	92 Ind. 8 Intra.	90 Eng.	60 Ind. 36 N.P. FFRDC	98 Ind.
Library of Congress	2.8	3	–	54	46	98 Intra.	–	–	100 Other	100 Intra.	96 Intra.
National Aeronautics and Space Administration	3,071.2	94	21	26	53	60 Ind. 33 Intra.	56 Phy Sci. 26 Environ. 10 Life 8 Eng.	49 Ind. 36 Intra. 8 Univ. FFRDC	52 Eng. 31 Environ. 8 Phy Sci.	49 Intra. 44 Ind.	73 Ind. 24 Intra.
National Science Foundation	653.2	83	78	18	4	78 Univ.	28 Phy Sci. 19 Eng. 19 Environ. 18 Life	96 Univ.	30 Other 25 Eng. 16 Soc. 11 Environ. 9 Life	50 Univ. 27 Ind. 11 N.P.	50 Univ. 28 N.P. 19 Univ. FFRDC
Office of Telecommunications Policy	1.3	14	–	100	–	56 Ind. 24 Univ. 12 Intra. 8 Univ. FFRDC	–	–	57 Soc. 43 Eng.	56 Ind. 24 Univ. 12 Intra. 8 Univ. FFRDC	–
Small Business Administration	.2	(4)	–	100	–	57 Intra. 43 Univ.	–	–	100 Soc.	57 Intra. 43 Univ.	–
Smithsonian Institution	25.6	27	100	–	–	91 Intra. 8 Univ.	43 Life 32 Soc. 17 Phy Sci. 8 Environ.	91 Intra. 8 Univ.	–	–	–
Special Action Office for Drug Abuse Prevention	4.0	22	–	100	–	50 Intra. 36 Univ. 13 N.P.	–	–	100 Life	50 Intra. 35 Univ. 13 N.P.	–
Tennessee Valley Authority	18.4	5	–	90	10	68 Intra. 32 N.P.	–	–	76 Eng. 14 Life 9 Phy Sci.	65 Intra. 35 N.P.	100 Intra.
Arms Control and Disarmament Agency	1.5	16	–	93	7	51 Ind. 29 Intra. 13 N.P.	–	–	49 Eng. 25 Math. 14 Soc. 13 Environ.	54 Ind. 24 Intra. 14 N.P. 8 Univ.	100 Intra.

Major characteristics of R&D obligations of Federal agencies, fiscal year 1975 (est.) — Continued

Agency and subdivision	Total R&D obligations (millions of dollars)	R&D obligations as percent of total agency budget[1]	Total research and development: Character of work (percent distribution): Basic research	Total research and development: Character of work (percent distribution): Applied research	Total research and development: Character of work (percent distribution): Development	Total research and development: Major performers[2] (percent of total)	Basic research: Major fields of science[2] (percent of total)	Basic research: Major performers[2] (percent of total)	Applied research: Major fields of science[2] (percent of total)	Applied research: Major performers[2] (percent of total)	Development: Major fields of science[2] (percent of total)
United States Information Agency	.1	(4)	–	100	–	100 Intra.	–	–	100 Eng.	100 Intra.	–
Veterans Administration	93.9	1	4	87	9	97 Intra.	85 Life	95 Intra.	88 Life	100 Intra.	78 Intra. 13 Univ.

[1] Total agency budgets are derived from table 7, "Obligations Incurred, Net" of *The Budget of the United States Government, Fiscal Year 1975*, page 293.

[2] "Major" is here defined as any performer or field of science which singly accounts for at least 8 percent of total funds.

[3] Comparable data for total agency budget not available.

[4] Less than 0.5 percent.

NOTE: Intramural activities cover costs associated with the administration of intramural and extramural programs by Federal personnel as well as actual intramural performance.

ABBREVIATIONS

Performers

Intra.—Intramural.
Ind.—Industrial firms excluding Federally Funded Research and Development Centers (FFRDC's).
Ind. FFRDC—FFRDC's administered by industrial firms.
Univ. FFRDC—FFRDC's administered by universities and colleges.
N.P.—Other nonprofit institutions excluding FFRDC's.
N.P. FFRDC—FFRDC's administered by other nonprofit institutions.
S & L gov't—State and Local government.
For.—Foreign.

Fields of Science

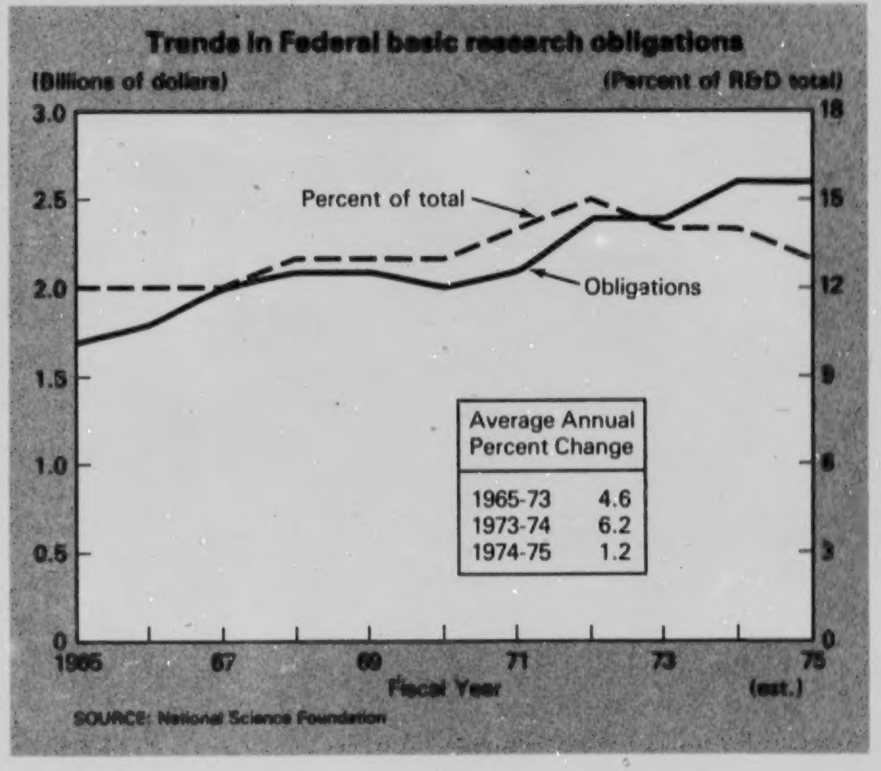
Life—Life sciences.
Psych.—Psychology
Phy. Sci.—Physical sciences
Math.—Mathematics
Eng.—Engineering
Soc.—Social sciences
Environ.—Environmental sciences.

Section 3. BASIC RESEARCH

- Federal obligations for basic research were $2,420 million in 1973. A rise to $2,569 million was anticipated in 1974 and a further rise to $2,599 million in 1975, a record high. In constant dollars, however, the highest point was reached in 1967.

- As a share of the Federal R&D total, basic research obligations reached a peak of 15 percent in 1972. This level compares with 12 percent in 1965. The share was expected to amount to 13 percent in 1975.

Trends in Federal basic research obligations



Average Annual Percent Change	
1965-73	4.6
1973-74	6.2
1974-75	1.2

SOURCE: National Science Foundation

Agencies

- Five agencies—NASA, HEW, NSF, AE
percent of Federal support for basic r
an estimated 87 percent in 1975.

- NASA remains the largest support ag
significant decreases in the 1973-75
$102 million primarily reflects the r
spacecraft, which are to be launched
1975. Work on the Mariner 10 progr
in funding in 1975. Mariner 10 spac
Mercury in 1974.

- The NASA share of the Federal basi
from a high of 33 percent in 1969 to a

- The chief reason for NASA's high lev
in the nature of its experiments, w
expendable equipment, such as laun

- HEW, the second largest suppor
increased its share of the Federal
percent in 1965 to 23 percent in 19
estimated for 1975. The 1975 funding
reflects the fact that some of the Nat
originally scheduled for obligations i
1974, causing that year to be unexp
scheduled decrease for the Alcohol,
Administration.

RESEARCH

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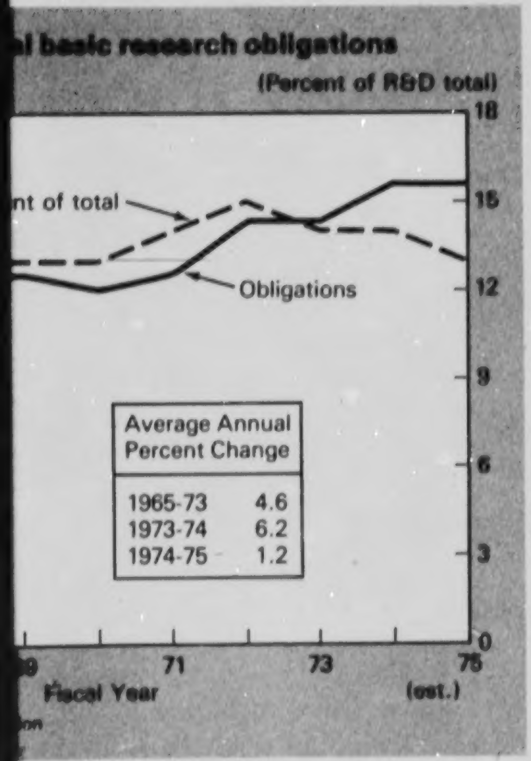

l basic research obligations

Agencies

- Five agencies—NASA, HEW, NSF, AEC, and DOD—accounted for 89 percent of Federal support for basic research in 1973 and 1974, and an estimated 87 percent in 1975.

- NASA remains the largest support agency for basic research despite significant decreases in the 1973-75 period. The 1975 decrease of $102 million primarily reflects the near completion of two Viking spacecraft, which are to be launched toward Mars in the summer of 1975. Work on the Mariner 10 program is also scheduled to decline in funding in 1975. Mariner 10 spacecraft encountered Venus and Mercury in 1974.

- The NASA share of the Federal basic research total has decreased from a high of 33 percent in 1969 to an estimated 24 percent in 1975.

- The chief reason for NASA's high level of basic research funding lies in the nature of its experiments, which call for large outlays for expendable equipment, such as launch vehicles and spacecraft.

- HEW, the second largest support agency for basic research, increased its share of the Federal basic research total from 18 percent in 1965 to 23 percent in 1974. A decline to 21 percent is estimated for 1975. The 1975 funding decrease of $44 million in part reflects the fact that some of the National Institutes of Health funds, originally scheduled for obligations in 1973, were not obligated until 1974, causing that year to be unexpectedly high. Also reflected is a scheduled decrease for the Alcohol, Drug Abuse, and Mental Health Administration.

Federal obligations for basic research, by agency

[Dollars in millions]

Agency	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$2,420	$2,569	+ 6.2	$2,599	+ 1.2
National Aeronautics and Space Administration	769	734	− 4.5	632	−13.9
Department of Health, Education and Welfare	458	588	+28.4	544	− 7.5
National Science Foundation	392	421	+ 7.2	509	+21.1
Atomic Energy Commission	275	286	+ 3.8	325	+13.8
Department of Defense	258	253	− 1.9	257	+ 1.6
Other agencies	268	288	+ 7.5	332	+15.5

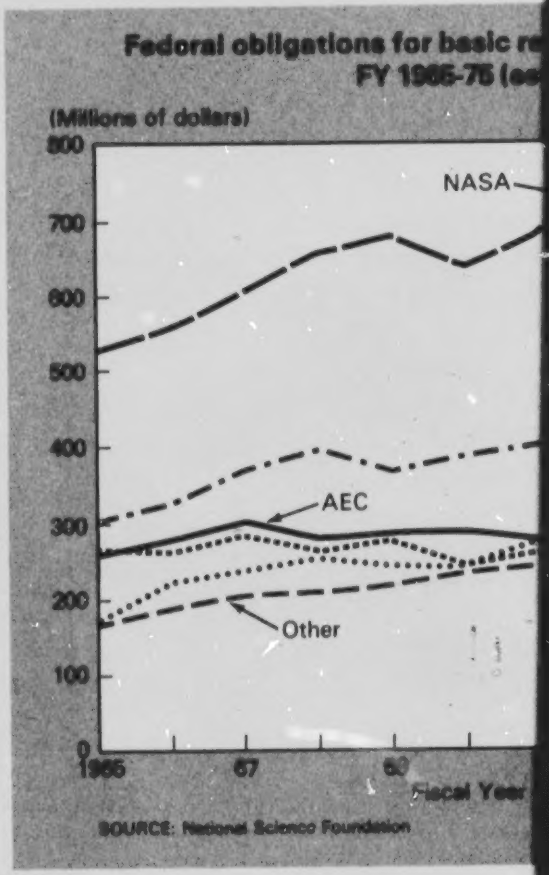
- NSF shows the largest absolute and the largest relative increase for basic research among the major agencies in the 1973-75 period. The 1975 rise of $89 million is primarily for Scientific Research Project Support for all the science disciplines. Particular emphasis is placed on energy research and on catalysis, biological pest control, plate tectonics, and effects of wind on the design and construction of tall buildings.

- NSF also reflects the highest rate of growth among all the agencies in the entire 1965-75 period with the result that its share of the Federal basic research total increased from 10 percent in 1965 to 20 percent in 1975.

- The scheduled AEC increase for 1975, second only to that of NSF, represents the first significant growth in basic research support for this agency since 1967. This $39 million increase provides for important growth in the controlled thermonuclear research program, which seeks to develop a new energy source from a nuclear fusion process. An increase in the physical sciences also provides for development of fundamental understanding of the properties and behavior of both matter and energy. The AEC share of the Federal basic research effort fell from 15 percent in 1965 to 11 percent in 1974 but was expected to increase to 13 percent in 1975.

- The DOD level of basic research shows li
(1973-75) period even though large incr
DOD's total R&D program in 1975. The s
Federal basic research total has dropped
an estimated 10 percent in 1975.

- The other agencies have doubled their
research in the 1965-75 period, while inc
Federal total from 10 percent to 13 percen
Smithsonian are primarily responsible
Geological Survey is the chief source of t
Interior in 1975.



Federal obligations for basic re
FY 1965-75 (es

SOURCE: National Science Foundation

or basic research, by agency

lars in millions]

Actual		Estimates		
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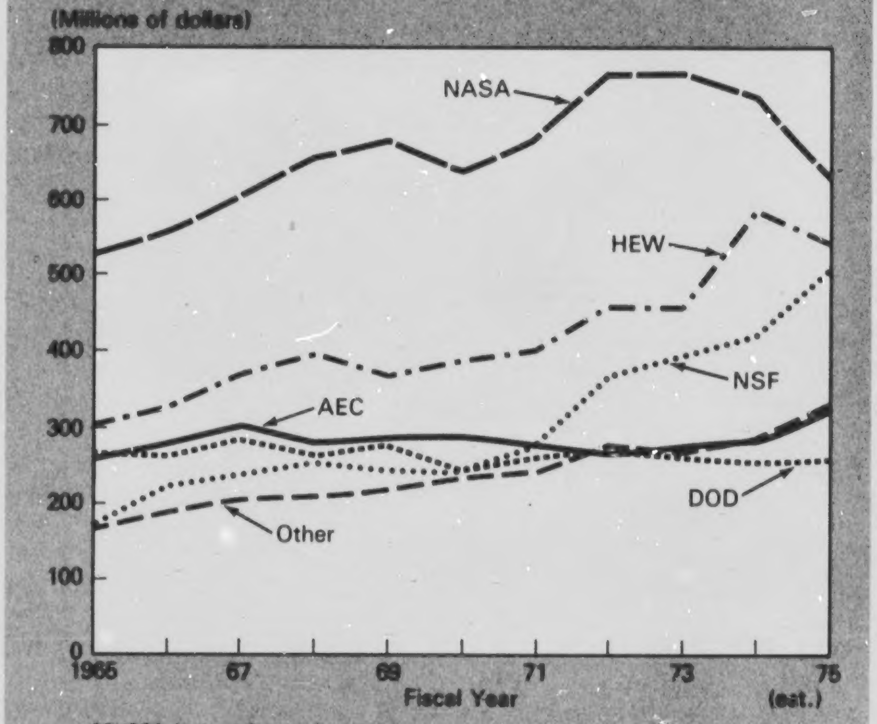
sical sciences also provides for devel-
anding of the properties and behavior
he AEC share of the Federal basic
cent in 1965 to 11 percent in 1974 but
percent in 1975.

- The DOD level of basic research shows little change in the current (1973-75) period even though large increases were proposed for DOD's total R&D program in 1975. The share of this agency in the Federal basic research total has dropped from 16 percent in 1965 to an estimated 10 percent in 1975.

- The other agencies have doubled their dollar support for basic research in the 1965-75 period, while increasing their share of the Federal total from 10 percent to 13 percent. USDA, Interior, and the Smithsonian are primarily responsible for this growth. The Geological Survey is the chief source of the scheduled increase for Interior in 1975.

Federal obligations for basic research, by agency, FY 1965-75 (est.)



SOURCE: National Science Foundation

Performers

- The share of the Federal basic research total performed by universities and colleges has risen from 38 percent in 1965 to an estimated 43 percent in 1975. A low of 35 percent was reflected in 1970.

- The planned NSF increase of $82 million for basic research support at universities and colleges in 1975 more than offsets the anticipated declines in HEW and DOD support. As a result, NSF will replace HEW as the largest supporter of research to this sector in 1975. The estimated 1975 basic research support of HEW, although lower than 1974, is 12 percent higher than the 1973 level.

- During the 1965-75 period Federal support of basic research at universities and colleges is characterized by a decline in DOD and NASA support and a growth in HEW and NSF support. The combined DOD/NASA share has fallen from 36 percent of the Federal total in 1965 to an estimated 20 percent in 1975. During the same period the HEW share increased from 22 percent to 28 percent, and the NSF share increased from 17 percent to 33 percent.

- Over the 1965-75 period Federal intramural performers have accounted for approximately one-fourth of federally supported basic research in almost every year—an estimated 25 percent in 1975.

Federal obligations for basic research, by performer

[Dollars in millions]

Performer	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$2,420	$2,569	+ 6.2	$2,599	+ 1.2
Federal intramural	585	635	+ 8.6	655	+ 3.1
Industrial firms[1]	545	495	− 9.2	406	−17.9
Universities and colleges	924	1,036	+12.2	1,124	+ 8.5
FFRDC's administered by universities	252	264	+ 4.8	288	+ 9.3
Other nonprofit institutions[1]	88	106	+19.8	94	−10.7
Other performers	26	34	+27.1	32	− 5.3

[1] Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

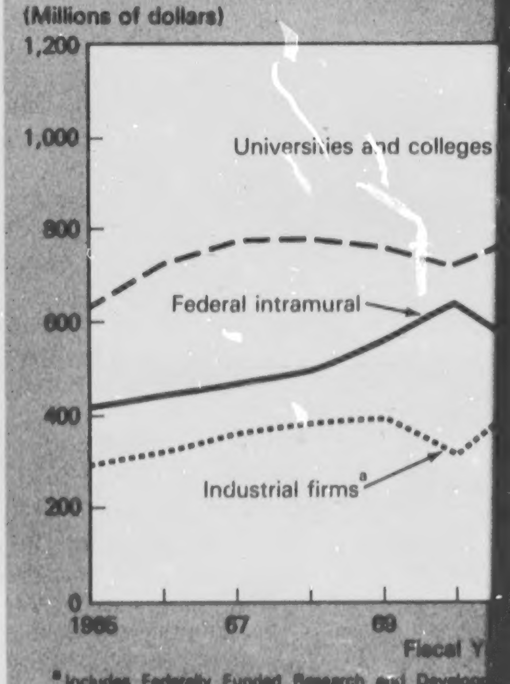
55

- NASA and Interior are primarily r
increase in Federal obligations to intramu
and 1975. Other key agencies in intram
DOD, and HEW—show little support cha

- Between 1973 and 1975 the sharp dec
to industrial firms was caused by NASA
industrially performed basic research
NASA programs. This agency has
three-fourths of the Federal total for this

- As a share of the total Federal bas
performance was expected to decrease
1973 to 16 percent in 1975—the lowest s
period.

Trends in Federal basic r
by major per



[a] Includes Federally Funded Research and Develop
industrial firms.

SOURCE: National Science Foundation

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Federal support of basic research at aracterized by a decline in DOD and HEW and NSF support. The combined rom 36 percent of the Federal total in nt in 1975. During the same period the ercent to 28 percent, and the NSF share 3 percent.

Federal intramural performers have ne-fourth of federally supported basic —an estimated 25 percent in 1975.

r basic research, by performer

lars in millions]

Actual	Estimates			
1973	1974	Percent change 1973-74	1975	Percent change 1974-75
$2,420	$2,569	+ 6.2	$2,599	+ 1.2
585	635	+ 8.6	655	+ 3.1
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88	106	+19.8	94	−10.7
26	34	+27.1	32	− 5.3

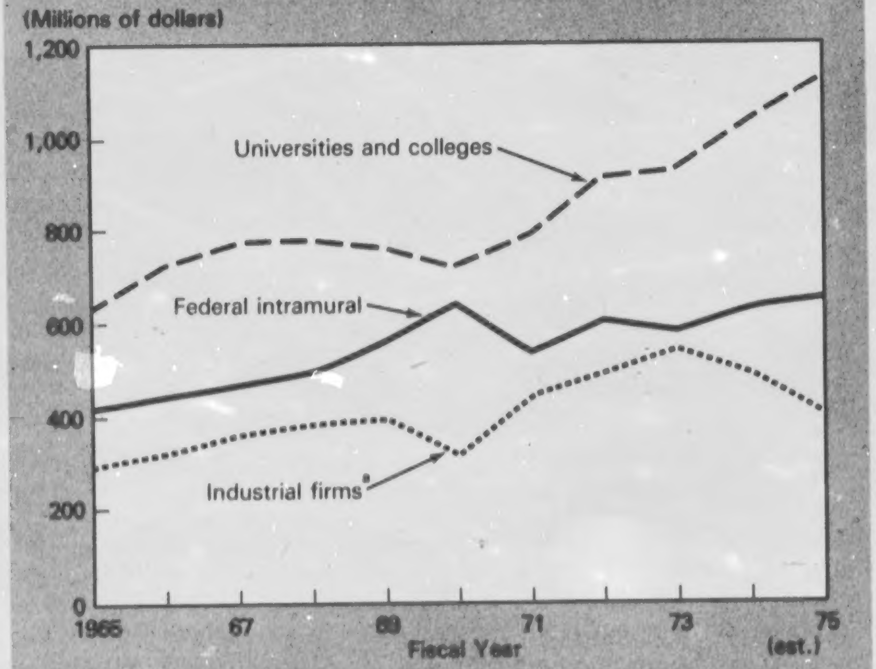
pment Centers (FFRDC's) administered by this sector.

- NASA and Interior are primarily responsible for the estimated increase in Federal obligations to intramural performers between 1973 and 1975. Other key agencies in intramural basic research—USDA, DOD, and HEW—show little support change in the current period.

- Between 1973 and 1975 the sharp decline in basic research support to industrial firms was caused by NASA cutbacks. The whole trend of industrially performed basic research has been directly related to NASA programs. This agency has accounted for more than three-fourths of the Federal total for this sector in the 1965-75 decade.

- As a share of the total Federal basic research effort, industrial performance was expected to decrease from a high of 23 percent in 1973 to 16 percent in 1975—the lowest share registered in the 1965-75 period.

Trends in Federal basic research obligations by major performer



[a] Includes Federally Funded Research and Development Centers (FFRDC's) administered by industrial firms.

SOURCE: National Science Foundation

Fields

- The physical sciences share of the basic research total declined from 38 percent in 1965 to an estimated 33 percent in 1974 and 34 percent in 1975. AEC, NASA, and NSF provide the chief support to the physical sciences and account for most of the 1975 increase.

- The life sciences were expected to decrease from 34 percent of the Federal total in 1974 to 31 percent in 1975. They represented 29 percent in 1965. Approximately one-half of the obligations to this field are provided by HEW.

- Support to the environmental sciences amounted to 16 percent of the basic research total in 1965, increased to a high of 17 percent in 1970, and declined to the 16-percent level again in 1975. A sharp drop in NASA support of the environmental sciences in 1975 more than offsets a significant increase planned by the Geological Survey (Interior). NASA, NSF, Interior, and DOD provide the major support to this field.

- NSF is primarily responsible for the large 1975 increase anticipated for basic research in engineering. NSF was expected to move from third place to first place in terms of engineering support, ahead of DOD and NASA. The engineering sciences will constitute 10 percent of the basic research total in 1975, compared to 9 percent in 1965.

- Mathematics shows a slight tendency to decline as a share of Federal basic research in the past 10 years with an estimated 2 percent of the total in 1975. Meanwhile, the share of the social sciences has increased from 2 percent to 4 percent.

Federal obligations for basic research

[Dollars in millions]

Field of science
Total
Life sciences
Psychology
Physical sciences
Astronomy
Chemistry
Physics
Other
Environmental sciences
Atmospheric
Geological
Oceanography
Other
Mathematics
Engineering
Social sciences
Other sciences

of the basic research total declined
stimated 33 percent in 1974 and 34
NSF provide the chief support to the
r most of the 1975 increase.

ed to decrease from 34 percent of the
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gineering sciences will constitute 10
in 1975, compared to 9 percent in

tendency to decline as a share of
0 years with an estimated 2 percent
he share of the social sciences has
ent.

Federal obligations for basic research by field of science

[Dollars in millions]

Field of science	Actual		Estimates	
	1965	1973	1974	1975
Total	$1,690	$2,420	$2,569	$2,599
Life sciences	487	758	869	800
Psychology	58	51	62	55
Physical sciences	639	796	830	880
Astronomy	177	202	202	242
Chemistry	109	195	203	191
Physics	327	389	400	431
Other	26	10	25	17
Environmental sciences	263	445	430	418
Atmospheric	133	219	204	186
Geological	96	164	156	154
Oceanography	34	52	60	69
Other	—	11	10	10
Mathematics	57	57	56	62
Engineering	147	206	209	268
Social sciences	37	78	91	100
Other sciences	2	28	22	15

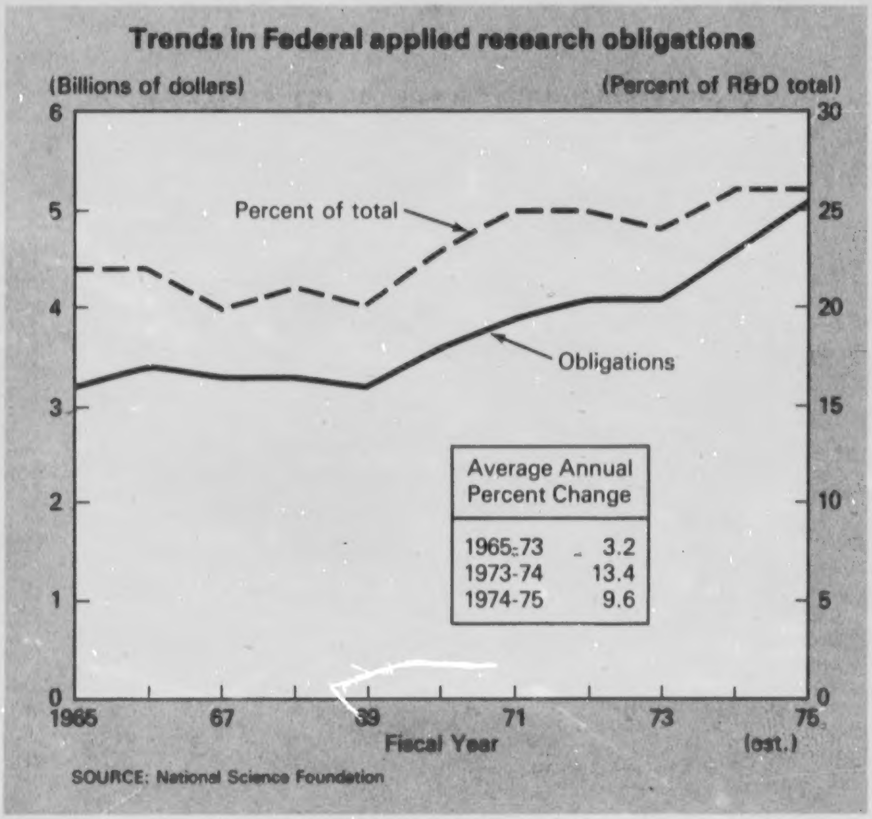
Section 4. APPLIED RESEARCH

- Federal support of applied research was scheduled to increase from \$4.1 billion in 1973 to \$4.6 billion in 1974, and to increase further to \$5.1 billion in 1975. In constant dollars, a reasonable estimate for 1975 would place the level for that year at almost the highest ever attained.

- The applied research total grew at an average annual rate of 11.5 percent between 1973 and 1975, compared with only 3.2 percent between 1965 and 1973.

- The applied research portion of the Federal R&D total was expected to be 26 percent in 1975 against 22 percent in 1965.

Trends in Federal applied research obligations



SOURCE: National Science Foundation

Agencies

- The three principal agencies in supp
HEW, and NASA—continue to contr
(1973-75) period. The combined eff
decreased from 89 percent of the
estimated 72 percent in 1975. Only
growth.

- DOD reflects the fourth largest incre
Most of the rise is attributable to the
engineering and physical sciences.T
applied research effort was almost
approximately one-third in 1975.

- HEW is the only major agency to sho
support in 1975. As in the case of
partially reflects the fact that som
funds, originally scheduled for obliga
until 1974, causing that year to be u
Drug Abuse, and Mental Health Adm
expected to contract in 1975. The HE
an estimated 25 percent in 1975 com

- NASA plans the largest increase for
in 1975. This expansion of effort is
missions, scheduled for 1977, and fo
shuttle program. Over the entire 1
research effort has increased at an
1 percent, and its share of the Fede
cent in 1965 to an estimated 16 perc

- The next six agencies in terms of ap
AEC, Interior, EPA, Commerce, and
tantly to the growth in applied re
period. The combined dollar total o

ED RESEARCH

esearch was scheduled to increase from
llion in 1974, and to increase further to
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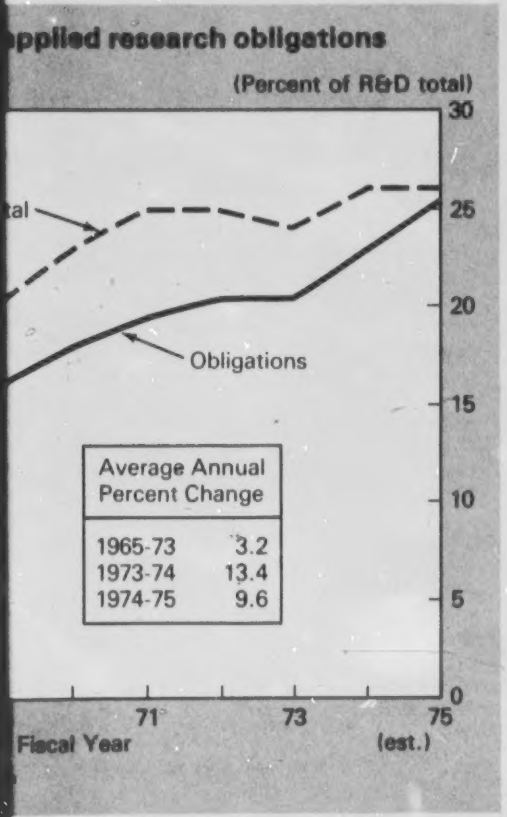

pplied research obligations

Average Annual Percent Change	
1965-73	3.2
1973-74	13.4
1974-75	9.6

Agencies

- The three principal agencies in support of applied research—DOD, HEW, and NASA—continue to contribute to growth in the current (1973-75) period. The combined effort of the three agencies has decreased from 89 percent of the Federal total in 1965 to an estimated 72 percent in 1975. Only HEW has influenced long-term growth.

- DOD reflects the fourth largest increase in applied research in 1975. Most of the rise is attributable to the Air Force, chiefly in the areas of engineering and physical sciences.The DOD share of the Federal applied research effort was almost one-half in 1965, but will be approximately one-third in 1975.

- HEW is the only major agency to show a decline in applied research support in 1975. As in the case of basic research, this decrease partially reflects the fact that some National Institutes of Health funds, originally scheduled for obligation in 1973, were not obligated until 1974, causing that year to be unexpectedly high. The Alcohol, Drug Abuse, and Mental Health Administration programs were also expected to contract in 1975. The HEW share of the Federal total is an estimated 25 percent in 1975 compared with 18 percent in 1965.

- NASA plans the largest increase for applied research of any agency in 1975. This expansion of effort is primarily for the outer planet missions, scheduled for 1977, and for research related to the space shuttle program. Over the entire 1965-75 period, NASA's applied research effort has increased at an average annual rate of less than 1 percent, and its share of the Federal total has fallen from 24 percent in 1965 to an estimated 16 percent in 1975.

- The next six agencies in terms of applied research support—USDA, AEC, Interior, EPA, Commerce, and NSF—have contributed importantly to the growth in applied research over the entire 1965-75 period. The combined dollar total of these agencies has increased

Federal obligations for applied research, by agency

[Dollars in millions]

Agency	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$4,080	$4,628	+13.4	$5,074	+ 9.6
Department of Defense	1,497	1,540	+ 2.9	1,611	+ 4.6
Department of Health, Education, and Welfare	1,001	1,313	+31.2	1,254	− 4.6
National Aeronautics and Space Administration	610	688	+12.7	806	+17.2
Department of Agriculture	211	223	+ 5.4	235	+ 5.3
Atomic Energy Commission	150	167	+11.6	221	+32.5
Department of the Interior	93	110	+18.3	219	+97.7
Environmental Protection Agency	65	85	+30.5	163	+91.9
Department of Commerce	114	123	+ 8.0	133	+ 8.2
National Science Foundation	72	83	+15.7	119	+43.4
Department of Transportation	77	87	+13.3	96	+10.5
Veterans Administration	67	75	+12.7	82	+ 8.8
All others	124	134	+ 8.6	136	+ 1.6

almost fourfold between 1965 and 1975 and has risen from 9 percent of the Federal applied research effort in 1965 to 21 percent in 1975. These agencies were expected to account for $298 million of the total increase of $446 million scheduled for 1975. Much of the 1975 growth results from the accelerated energy R&D program.

- USDA shows a steady growth in applied research support each year in the 1965-75 period. Its share of the Federal total has ranged between 4 percent and 5 percent.

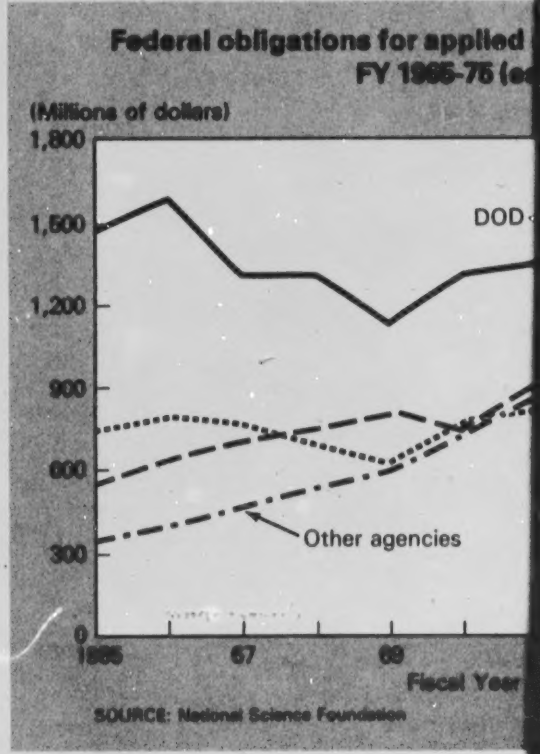
- AEC's applied research shows strong growth in the entire 1965-75 period. During this time its share of the Federal total has increased from 2 percent to 4 percent. The planned 1975 increase is primarily to step up biomedical and environmental research on the assessment of risks associated with radiation related to energy effluents common to all sources of power.

- Interior is scheduled for the largest increase in 1975 of any agency. This growth provides for expanded energy-related programs within the Office of Coal Research, the Bureau of Mines, and the Office of the Secretary. Interior's share of the a expected to be 4 percent in 1975, compar

- The 1975 increase for EPA is for expand environmental research. EPA's share of has increased from 1 percent in 1970, formed, to an estimated 4 percent in 197

- Commerce has increased its share of the t from less than 1 percent in 1965 to 3 pe rise derives from expanded work withi Standards and the National Oceanic and tion.

- The NSF share of the total has increased less than one-tenth of 1 percent to 2 p mainly directed to energy-related re program.



SOURCE: National Science Foundation

or applied research, by agency

ollars in millions]

Actual	Estimates			
1973	1974	Percent change 1973-74	1975	Percent change 1974-75
$4,080	$4,628	+ 13.4	$5,074	+ 9.6
1,497	1,540	+ 2.9	1,611	+ 4.6
1,001	1,313	+31.2	1,254	− 4.6
610	688	+ 12.7	806	+ 17.2
211	223	+ 5.4	235	+ 5.3
150	167	+ 11.6	221	+ 32.5
93	110	+ 18.3	219	+ 97.7
65	85	+ 30.5	163	+ 91.9
114	123	+ 8.0	133	+ 8.2
72	83	+ 15.7	119	+ 43.4
77	87	+ 13.3	96	+ 10.5
67	75	+ 12.7	82	+ 8.8
124	134	+ 8.6	136	+ 1.6

and 1975 and has risen from 9 percent
h effort in 1965 to 21 percent in 1975.
to account for $298 million of the total
led for 1975. Much of the 1975 growth
nergy R&D program.

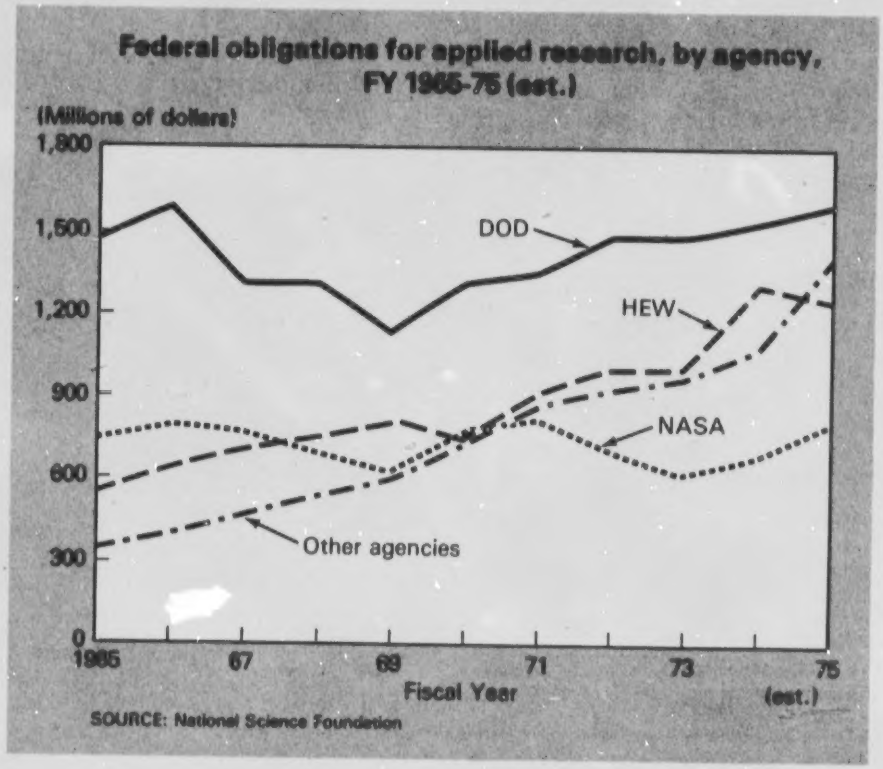
n applied research support each year
are of the Federal total has ranged
ent.

strong growth in the entire 1965-75
re of the Federal total has increased
e planned 1975 increase is primarily
onmental research on the assessment
n related to energy effluents common

rgest increase in 1975 of any agency.
ded energy-related programs within
e Bureau of Mines, and the Office of

the Secretary. Interior's share of the applied research total was expected to be 4 percent in 1975, compared with 2 percent in 1965.

- The 1975 increase for EPA is for expanded work on energy-related environmental research. EPA's share of the applied research total has increased from 1 percent in 1970, the year the agency was formed, to an estimated 4 percent in 1975.
- Commerce has increased its share of the total applied research effort from less than 1 percent in 1965 to 3 percent in 1975. Most of this rise derives from expanded work within the National Bureau of Standards and the National Oceanic and Atmospheric Administration.
- The NSF share of the total has increased in the 1965-75 period from less than one-tenth of 1 percent to 2 percent. Funding in 1975 is mainly directed to energy-related research under the RANN program.



Federal obligations for applied research, by agency, FY 1965-75 (est.)

SOURCE: National Science Foundation

Performers

- The Federal intramural sector accounts for one-third of the 1975 increase in total obligations for applied research, mainly as a result of Interior, DOD, and NASA program changes. Applied research performed directly by agencies has shown strong growth in the past decade.

- The intramural share of the Federal applied research total has increased from 33 percent in 1965 to an estimated 39 percent in 1975. DOD, NASA, and HEW have been the major contributors to this rise.

- The industrial sector, the chief performance area in 1965, declined sharply between 1966 and 1969. Since 1970, however, industry has shown a steady rise in activity and was expected to account for 60 percent of the total increase in applied research obligations in 1975. DOD and NASA are primarily responsible for the trend in industry funding between 1969 and 1974. In 1975, EPA, Interior, and NSF were scheduled for strong additional support to industry as a result of expanding energy-related programs.

Federal obligations for applied research, by performer

[Dollars in millions]

Performer	Actual		Estimates			
	1965	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$3,164	$4,080	$4,628	+13.4	$5,074	+ 9.6
Federal intramural	1,029	1,613	1,834	+13.7	1,980	+ 7.9
Industrial firms[1]	1,235	1,169	1,216	+ 4.0	1,485	+22.1
Universities and colleges	480	770	945	+22.8	929	− 1.7
FFRDC's administered by universities	189	131	144	+ 9.5	179	+24.7
Other nonprofit institutions[1]	180	295	354	+20.1	362	+ 2.1
Other performers	51	102	135	+32.8	140	+ 3.6

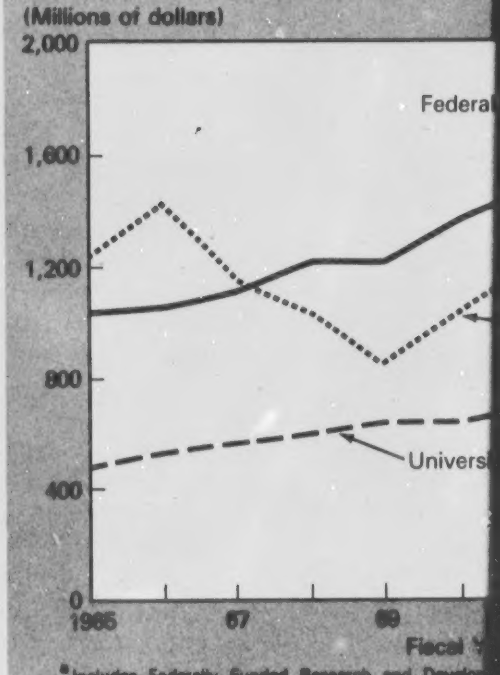
[1] Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

The share of industry in applied rese
agencies was 39 percent in 1965 and an

- The university-and-college sector
research performance from 1965 to 1
expected in 1975. HEW was primarily r
funding.

- The university-and-college share of
total has increased from 15 percent in 19
in 1975.

Trends in Federal applied
by major per



*Includes Federally Funded Research and Develop
industrial firms.

SOURCE: National Science Foundation

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or applied research, by performer

Dollars in millions]

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770	945	+ 22.8	929	– 1.7
131	144	+ 9.5	179	+ 24.7
295	354	+ 20.1	362	+ 2.1
102	135	+ 32.8	140	+ 3.6

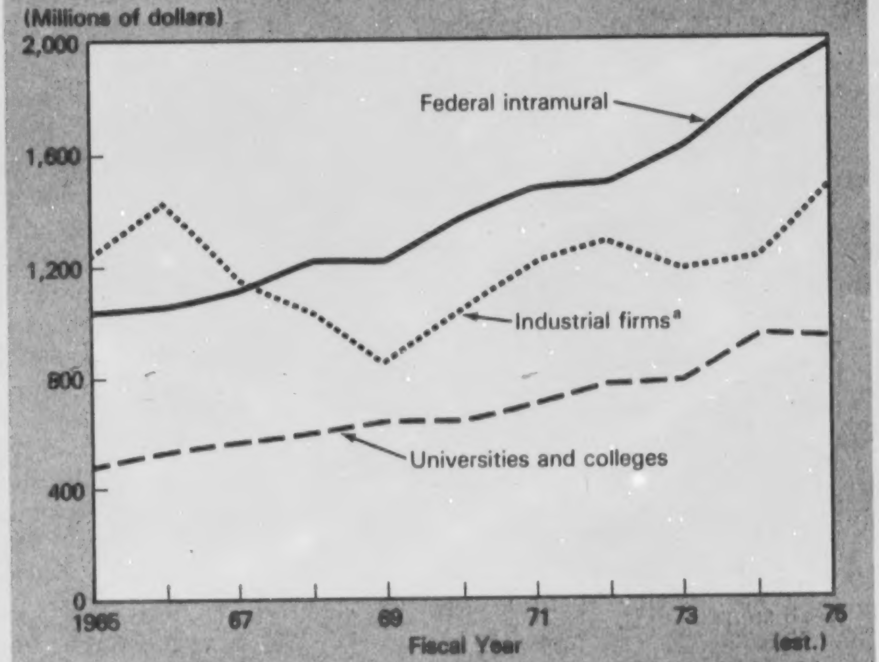
elopment Centers (FFRDC's) administered by this sector.

The share of industry in applied research performance by Federal agencies was 39 percent in 1965 and an estimated 29 percent in 1975.

- The university-and-college sector grew steadily in applied research performance from 1965 to 1974. A slight decrease was expected in 1975. HEW was primarily responsible for the changes in funding.

- The university-and-college share of the Federal applied research total has increased from 15 percent in 1965 to an estimated 18 percent in 1975.

Trends in Federal applied research obligations by major performer



[a] Includes Federally Funded Research and Development Centers (FFRDC's) administered by industrial firms.

SOURCE: National Science Foundation

Fields

- Over the past decade the engineering sciences have made up the largest share of the applied research total. In 1975 their portion will be 39 percent compared with 45 percent in 1965. Major support to engineering has been provided by DOD and NASA. The expanding energy-related programs of Interior and EPA, however, will contribute significantly to the large increases planned in engineering in 1975.

- The life sciences share of total applied research obligations has increased from 21 percent in 1965 to an estimated 35 percent in 1974, but was expected to decline to 31 percent in 1975. HEW is the primary funding agency for the life sciences.

- On the other hand, the physical sciences portion of the total fell from 12 percent in 1965 to 8 percent in 1974. An increase to 10 percent was estimated for 1975. Although DOD and AEC are the major sources of support to the physical sciences, EPA and NASA were also expected to contribute to the 1975 increase.

- The environmental sciences will receive 9 percent of the applied research total in 1975, compared with 13 percent in 1965. Most support to the environmental sciences is provided by NASA and DOD.

- Support to the social sciences has tripled between 1965 and 1975, while the social sciences share of the applied research effort has risen from 3 percent to 5 percent. HEW is the chief funder of this field.

- Mathematics and psychology will each receive less than 2 percent of the applied research total in 1975, approximately the same as in 1965. Primary support is provided by DOD.

Federal obligations for applied resear

[Dollars in millions]

Field of science
Total
Life sciences
Psychology
Physical sciences
Astronomy
Chemistry
Physics
Other
Environmental sciences
Atmospheric
Geological
Oceanography
Other
Mathematics
Engineering
Social sciences
Other sciences

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rch total. In 1975 their portion will be
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is the chief funder of this field.

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1975, approximately the same as in
by DOD.

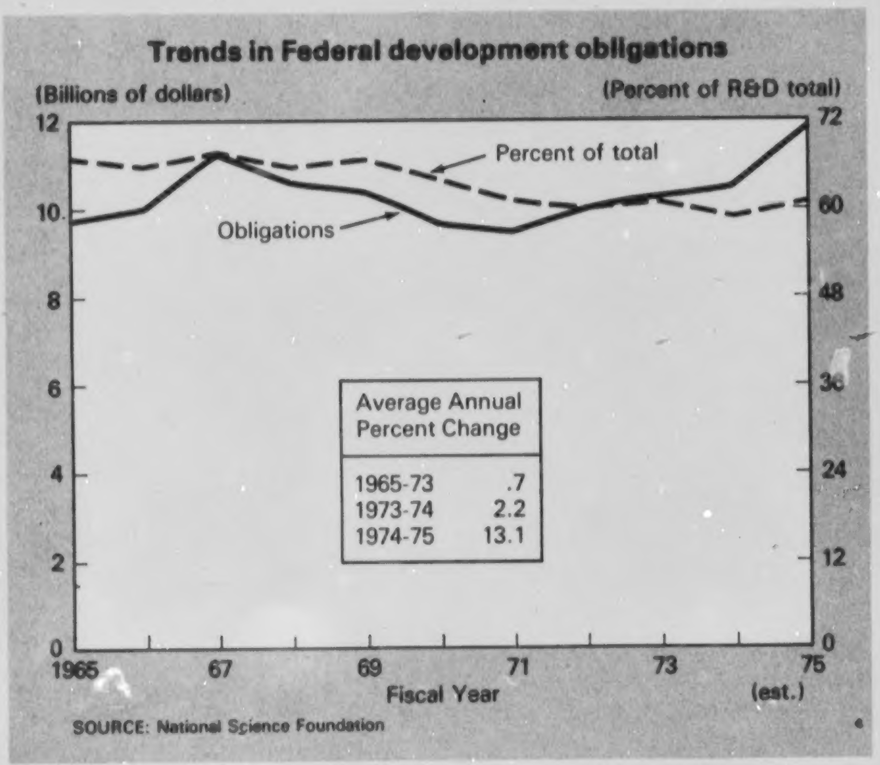
Federal obligations for applied research, by field of science

[Dollars in millions]

Field of science	Actual		Estimates	
	1965	1973	1974	1975
Total	$3,164	$4,080	$4,628	$5,074
Life sciences	680	1,300	1,597	1,563
Psychology	46	66	76	73
Physical sciences	390	330	382	490
Astronomy	15	2	6	11
Chemistry	135	114	129	144
Physics	210	179	214	298
Other	30	34	33	37
Environmental sciences	413	346	382	455
Atmospheric	111	137	143	145
Geological	268	95	97	128
Oceanography	23	59	66	84
Other	11	56	76	98
Mathematics	48	69	86	91
Engineering	1,429	1,554	1,700	1,958
Social sciences	90	218	246	274
Other sciences	68	197	161	172

Section 5. DEVELOPMENT

- Federal obligations for development rose from $10.3 billion in 1973 to an estimated $10.5 billion in 1974. Another increase to $11.9 billion was scheduled for 1975.
- The 1975 level represents a new high in Federal obligations for development work. The previous peak was $11.3 billion in 1967. When constant dollars are used (with a reasonable estimate for 1975) the previous peak, by a considerable margin, is still 1967.
- The development share of the Federal R&D total declined from 67 percent in 1965 to a low of 59 percent in 1974. The share in 1975 is an estimated 61 percent.


Trends in Federal development obligations

Average Annual Percent Change	
1965-73	.7
1973-74	2.2
1974-75	13.1

SOURCE: National Science Foundation

Agencies

- DOD, NASA, and AEC were expected t Federal development effort in 1975, c 1965.
- DOD has been making up an increas total. The ratio will be an estimated with 52 percent in 1965.
- DOD planned the largest dollar increa expansion was scheduled by the Na Trident submarine-based missile, the small strategic submarine. Important the Air Force for development of the B the EF-111A electronic warfare suppo and the Airborne Warning and C programs.
- NASA remains the second largest although its share of the Federal de from 38 percent in 1965 to an estimat funding increase is related to expansi shuttle, which more than offsets a d tion of Skylab.
- AEC maintained a fairly constant between 1965 and 1974, and the AEC around 9 percent. An increase of $17 1975, primarily for Federal acceler

.OPMENT

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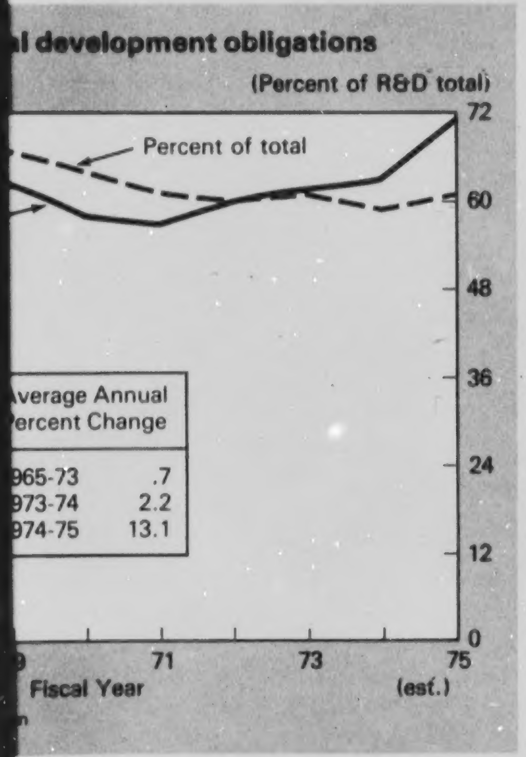

l development obligations

Agencies

- DOD, NASA, and AEC were expected to account for 88 percent of the Federal development effort in 1975, compared with 99 percent in 1965.

- DOD has been making up an increasing share of the development total. The ratio will be an estimated 65 percent in 1975, compared with 52 percent in 1965.

- DOD planned the largest dollar increase of any agency in 1975. Chief expansion was scheduled by the Navy for such programs as the Trident submarine-based missile, the CH-53E helicopter, and a new small strategic submarine. Important increases were also planned by the Air Force for development of the B-1 advanced strategic bomber, the EF-111A electronic warfare support aircraft, the advanced ICBM and the Airborne Warning and Control System, among other programs.

- NASA remains the second largest development support agency, although its share of the Federal development total has decreased from 38 percent in 1965 to an estimated 14 percent in 1975. The 1975 funding increase is related to expansion of development for the space shuttle, which more than offsets a decrease resulting from completion of Skylab.

- AEC maintained a fairly constant level of development support between 1965 and 1974, and the AEC share of the total has remained around 9 percent. An increase of $179 million, however, is planned in 1975, primarily for Federal accelerated development of the liquid

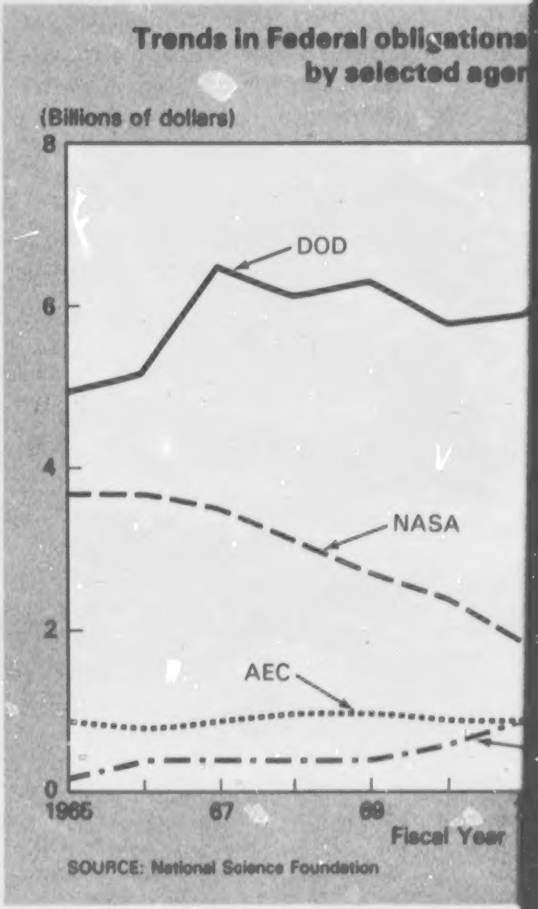
Federal obligations for development, by agency

[Dollars in millions]

Agency	Actual		Estimates		
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$10,321	$10,546	+ 2.2	$11,924	+ 13.1
Department of Defense	6,649	6,806	+ 2.4	7,740	+ 13.7
National Aeronautics and Space Administration	1,682	1,605	− 4.6	1,633	+ 1.8
Atomic Energy Commission	938	978	+ 4.3	1,158	+ 18.3
Department of Health, Education, and Welfare	378	445	+ 17.7	435	− 2.4
Department of Transportation	233	271	+ 15.9	300	+ 10.7
Department of the Interior	84	99	+ 19.0	230	+ 131.2
Environmental Protection Agency	106	80	−24.5	168	+ 109.7
Department of Commerce	60	68	+ 12.4	110	+ 61.4
Other agencies	191	194	+ 1.0	150	− 22.7

metal fast breeder reactor (LMFBR) and other nuclear energy efforts. AEG's share of total Federal development was expected to be 10 percent in 1975.

- The combined total of all other agencies is an estimated 12 percent of the development total in 1975. The non-DOD/NASA/AEC group represented only 1 percent in 1965. HEW and DOT are responsible for most of the growth between 1965 and the current period. In 1975, however, the increase for the "other agency" group is primarily attributable to energy-related development programs of Interior and EPA. The 1975 increase for Commerce, by contrast, results from the transfer of OEO's Community Development Program to the Office of Minority Business Enterprise.



Trends in Federal obligations
by selected age

SOURCE: National Science Foundation

or development, by agency

rs in millions]

Actual	Estimates			
1973	1974	Percent change 1973-74	1975	Percent change 1974-75
10,321	$10,546	+ 2.2	$11,924	+ 13.1
6,649	6,806	+ 2.4	7,740	+ 13.7
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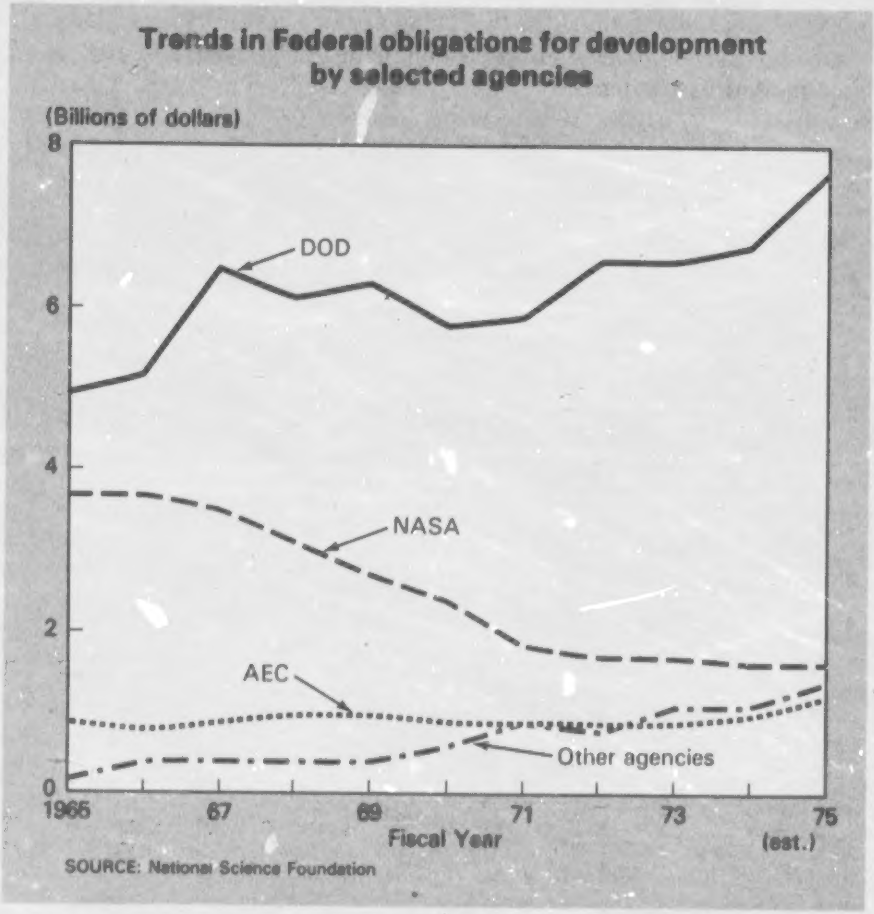

Trends in Federal obligations for development by selected agencies

SOURCE: National Science Foundation

Performers

- Federal funds to industrial firms for development work increased from $6.7 billion in 1973 to $6.9 billion in 1974. Another rise to $8.1 billion was scheduled for 1975. Even so, this total is still below the peak of $8.8 billion reached in 1967. The industry share of the total Federal development effort has fallen from 77 percent in 1965 to 65 percent in 1974, although the share was expected to increase to 68 percent in 1975.

- The 1975 increase to industrial performers will result primarily from planned growth by DOD. Additionally, AEC, Interior, and EPA expect to increase development contracts to industrial firms.

- The Federal intramural development effort has grown as a share of total Federal development, from 17 percent in 1965 to an estimated 22 percent in 1975. DOD accounts for approximately three-fourths of the intramural total and has been the major influence in the generally rising support of this sector.

- The combined effort of all performers other than industrial firms and Federal laboratories was expected to account for 10 percent of the Federal total in 1975.

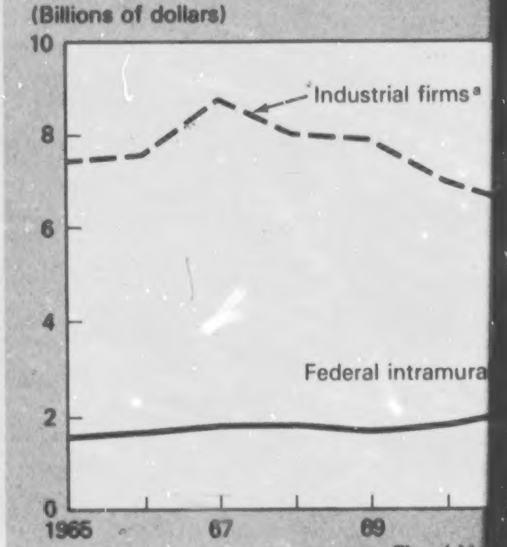
Federal obligations for development by performer

[Dollars in millions]

Performer	Actual		Estimates			
	1965	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$9,760	$10,321	$10,546	+ 2.2	$11,924	+ 13.1
Federal intramural	1,639	2,422	2,471	+ 2.0	2,633	+ 6.5
Industrial firms[1]	7,524	6,742	6,860	+ 1.8	8,054	+ 17.4
Universities and colleges	77	222	245	+ 10.4	243	− .9
FFRDC's administered by universities	224	342	375	+ 9.5	418	+ 11.7
Other nonprofit institutions[1]	274	400	448	+ 11.9	451	+ .6
Other performers	215	193	147	− 23.8	125	− 15.1

[1] Includes Federally Funded Research and Development Centers (FFRDC's) administered by this sector.

Trends in Federal develo
by major per



[a] Includes Federally Funded Research and Develop industrial firms.

SOURCE: National Science Foundation

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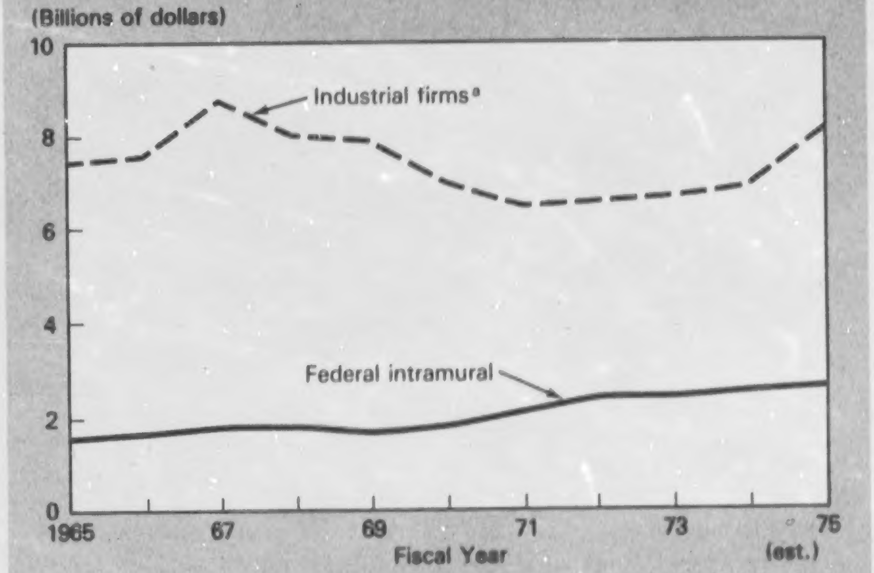
Trends in Federal development obligations by major performer



[a] Includes Federally Funded Research and Development Centers (FFRDC's) administered by industrial firms.

SOURCE: National Science Foundation

Section 6. GEOGRAPHIC DISTRIBUTION, 1973

Since 1963 data have been collected on the geographic distribution of Federal R&D funds, although only since 1968 have the data been collected on an annual basis.

For 1973 the 11 agencies participating in the survey reported a total of $16.5 billion in R&D obligations. Their combined funding represented 98 percent of the Federal R&D total. These agencies also reported $758 million for R&D plant.

Data are given on a prime contract basis, although a sample survey was made of the effects of first-tier subcontracting in 1973. Indications are that if subcontracting is taken into account, the dispersion of funds is greater than the pattern shown in the following pages.

Synposis

- In 1973 only two States, California and Maryland, received more than $1 billion in Federal R&D support. Since 1969 the number in this category had been three or four.
- The California level of $3.8 billion was almost as high as in 1970 and reflected a substantial increase over support to this State in 1972.
- The Maryland level of $1.4 billion was the highest on record for this State.
- Between 1972 and 1973 the number of States in the $500 million-to-$1 billion category increased from eight to nine.
- Every State (including the District of Columbia) received R&D support in 1973. The lowest amount received by any State was $9 million by North Dakota.
- Twenty-six States were reported as receiving higher amounts in 1973 than 1972, but of these only two showed increases of more than $100 million.
- The 25 States with decreases in fun
represented an unusually large numbe
year.
- The net result of these changes was
Federal R&D effort in 1973 compared
support States, although the concentr
did not change at all.

**Distribution of total Federal R
by State, FY 19**

Mountain
West North Central
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
UTAH
CALIF
Pacific
ARKANSAS
ALASKA
HAWAII
West South Central

ɹAPHIC DISTRIBUTION, 1973

collected on the geographic distribution gh only since 1968 have the data been

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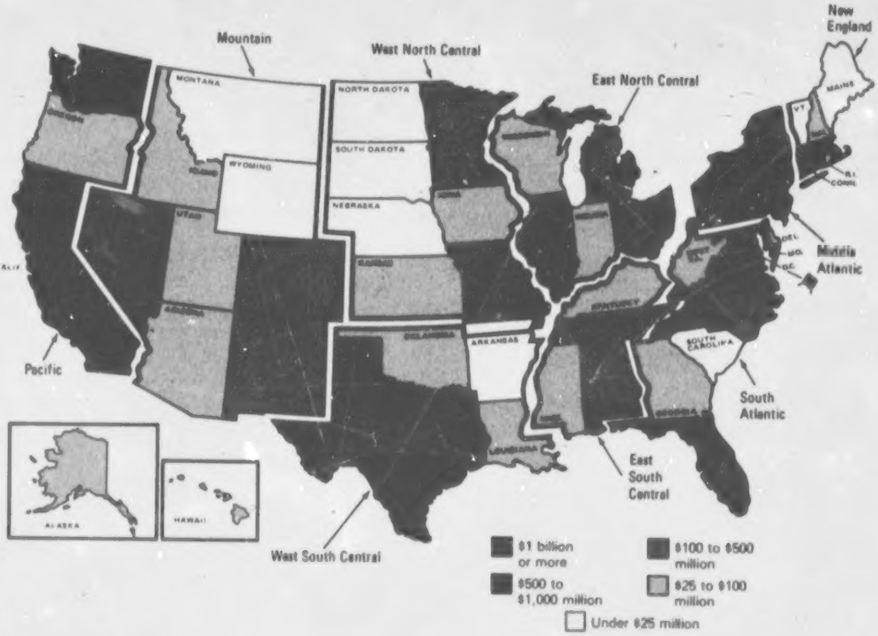
- The 25 States with decreases in funding between 1972 and 1973 represented an unusually large number to receive decreases in any year.

- The net result of these changes was greater concentration of the Federal R&D effort in 1973 compared with 1972 in the two leading support States, although the concentration in the 10 leading States did not change at all.

Distribution of total Federal R&D obligations, by State, FY 1973


Mountain
West North Central
East North Central
New England
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
OREGON
IDAHO
UTAH
ARIZONA
KANSAS
IOWA
WISCONSIN
INDIANA
KENTUCKY
OKLAHOMA
ARKANSAS
LOUISIANA
GEORGIA
MAINE
VT
N.H.
R.I.
CONN
DEL
MD.
D.C.
W. VA.
SOUTH CAROLINA
CALIF
Middle Atlantic
Pacific
South Atlantic
East South Central
West South Central
ALASKA
HAWAII
$1 billion or more
$500 to $1,000 million
$100 to $500 million
$25 to $100 million
Under $25 million

The Leading States

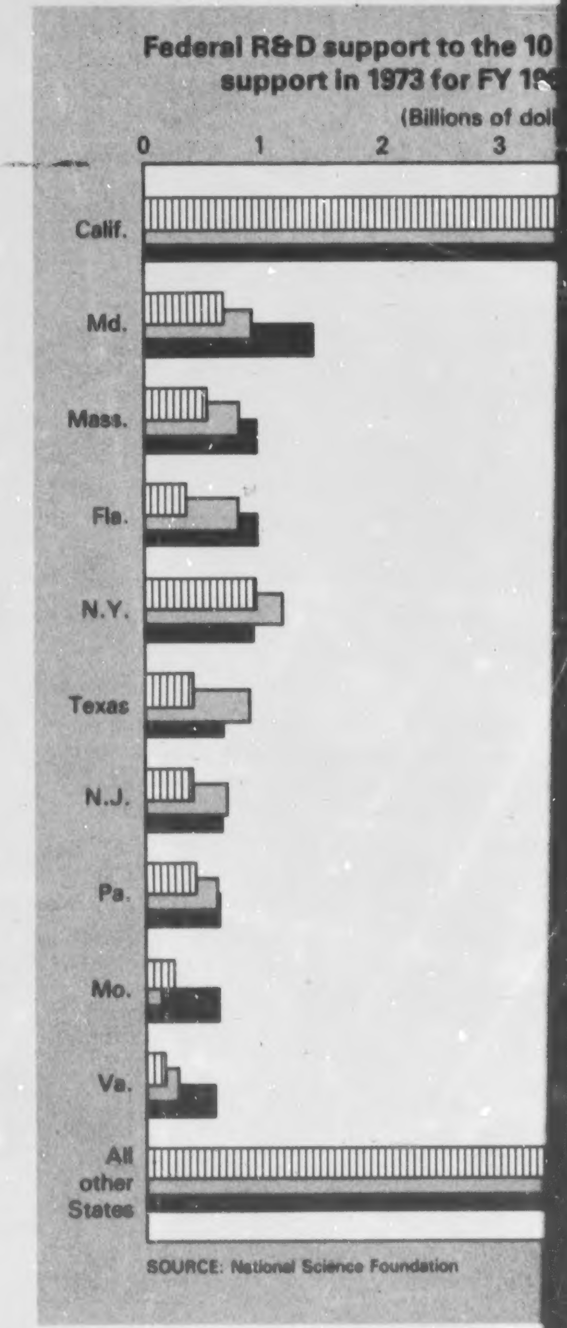
Federal R&D support has always tended to focus in a relatively small number of States. In both 1972 and 1973 the 10 leading States accounted for 68 percent of the Federal R&D total compared with slightly higher percentages in earlier years. Although the concentration among the leading 10 States, after decreasing between 1963 and 1972, did not change from 1972 to 1973, the share of the leading two States rose from 29 percent to 32 percent between 1972 and 1973.

Over the decade in which geographic data have been reported, 1963-73, the same States have tended to appear in the "leading 10" group. Eight States—California, Maryland, Massachusetts, Florida, New York, Texas, New Jersey, and Pennsylvania—have been among the 10 States leading in Federal R&D support. Another State in this group in 1973, Missouri, was also among the leading 10 in 1971 and 1972.

California remained well in the lead in 1973, with almost one-fourth of all Federal R&D performance taking place (or being managed) within its borders. The 23.3-percent share of California in 1973 compares with 35.1 percent in 1963 and a low of 21.4 percent in 1972. The $367 million increase for this State in 1973 was by far the largest for any State and was chiefly brought about by contracting on the part of DOD and NASA for missiles, aircraft, and aerospace work. A prime example would be the work done for the Navy Trident submarine-based missile system. While DOD and NASA placed their funds with industry, NSF provided added research support to universities and colleges. AEC and OEO increased their obligations to Federally Funded Research and Development Centers (FFRDC's). DOD and NASA also stepped up obligations to their own intramural facilities located in California.

The 1973 **Maryland** share of 8.7 percent in total Federal R&D support was the highest on record. This situation resulted from the increase of $117 million realized in 1973 over 1972, the second highest increase among the States. More than three out of five Federal R&D dollars in Maryland are obligated to intramural installations, and the heaviest support is provided by DOD, HEW, and NASA. The increases

Federal R&D support to the 10
support in 1973 for FY 19



SOURCE: National Science Foundation

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and OEO increased their obligations to
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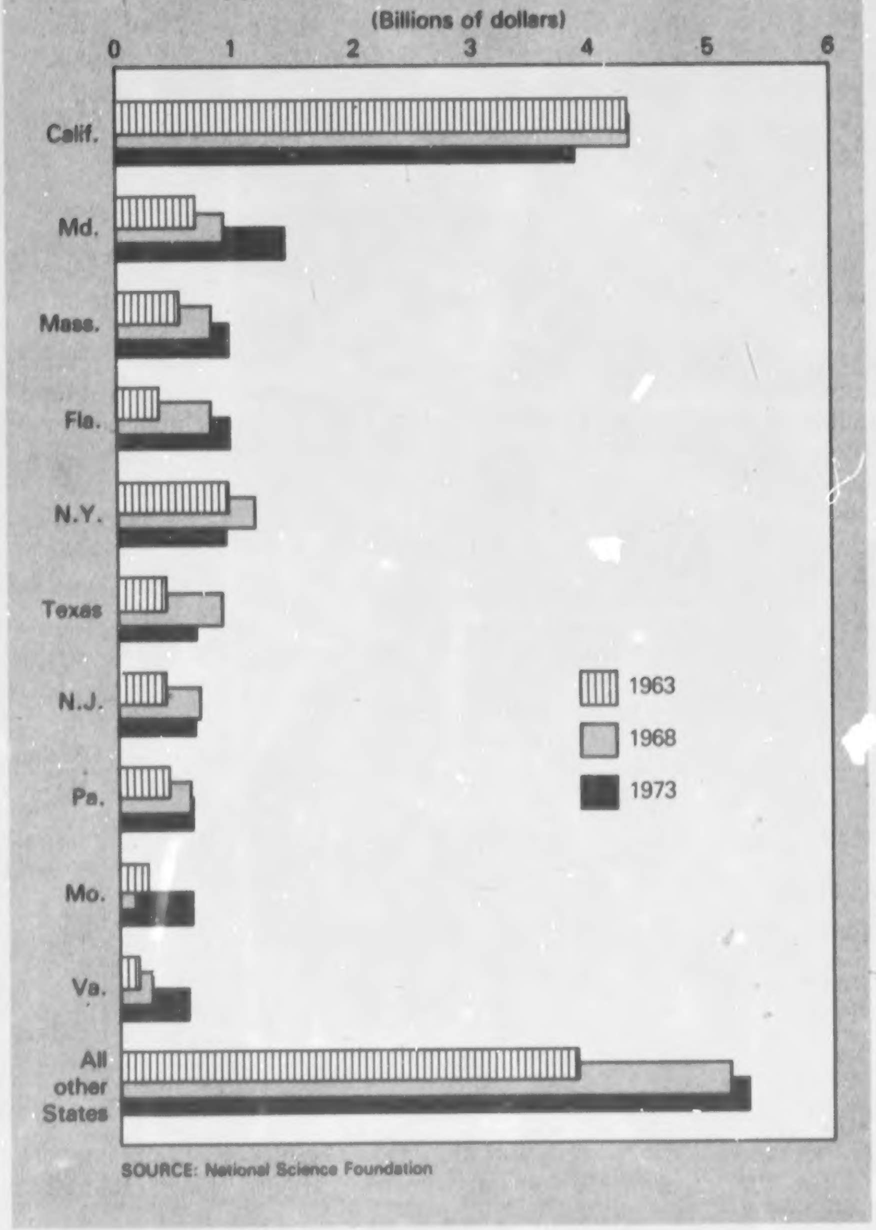
Federal R&D support to the 10 States leading in such support in 1973 for FY 1963, 1968, and 1973



SOURCE: National Science Foundation

for intramural work by these three agencies largely accounted for the 1973 growth, although the rise was partly caused by added contracting to industry on the part of DOD and NASA. Among the larger Federal laboratories and testing facilities in Maryland are the National Institutes of Health (HEW), the Naval Ordnance Laboratory (Navy), the Edgewood Arsenal Laboratories (Army), the Goddard Space Flight Center (NASA), the National Bureau of Standards (Commerce), and the Agricultural Research Center (USDA).

Massachusetts received almost the same amount of support in 1973 as 1972; the decline was relatively small. The share of this State in the Federal R&D total, 5.8 percent, scarcely changed. DOD is responsible for approximately two-thirds of the support to this State, and this support is distributed among intramural, industrial, university-and-college, and FFRDC performers. HEW is responsible for approximately one-eighth of the support, largely directed to universities and other nonprofit institutions. Neither of these agencies changed the amounts of their funding appreciably between 1972 and 1973, although some decline occurred for DOT in funding for the Transportation Systems Center and for NASA in the form of obligations to industrial firms and universities.

Distribution of Federal R&D obligations to the 10 States leading in such support in fiscal year 1973 for fiscal years 1963, 1968, 1972 and 1973

[Dollars in millions]

State	1963	1968	1972	1973
Total, all States (millions of dollars)	$12,251	$15,690	$16,262	$16,486
	Percent Distribution			
California	35.1	27.4	21.4	23.3
Maryland	5.5	5.8	8.1	8.7
Massachusetts	4.2	5.1	5.9	5.8
Florida	2.8	5.1	6.3	5.8
New York	7.7	7.5	6.6	5.7
Texas	3.2	5.6	4.0	3.9
New Jersey	3.3	4.3	4.7	3.9
Pennsylvania	3.6	3.9	3.9	3.8
Missouri	1.9	.8	4.2	3.7
Virginia	3.4	5.8	3.3	3.4
All other States[1]	29.3	28.7	31.6	32.0

[1] Includes outlying areas and offices abroad.

For **Florida**, the net decline of $71 mi
largest of any State and moved Florida be
State remained in fourth place, but the sh
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	3.2	5.6	4.0	3.9
	3.3	4.3	4.7	3.9
	3.6	3.9	3.9	3.8
	1.9	.8	4.2	3.7
	3.4	5.8	3.3	3.4
	29.3	28.7	31.6	32.0

For **Florida**, the net decline of $71 million in 1973 was the fourth largest of any State and moved Florida below the $1 billion mark. The State remained in fourth place, but the share of total decreased to 5.8 percent from 6.3 percent. The decline for Florida was entirely caused by smaller obligations awarded to industry by both DOD and NASA, and decreased intramural performance for NASA. In the case of NASA most work is carried out at the Kennedy Space Center at Cape Kennedy.

In 1973 **New York**, for the second consecutive year, experienced the greatest decrease in Federal R&D funding of any State. The net decline of $143 million moved New York below the $1 billion level and helped to move this State to fifth place in support for the first time. Almost the entire decrease was brought about by lower DOD obligations to industrial firms within the State. By 1973 work on several aircraft contracts was nearing the completion stage.

R&D support to **Texas** scarcely changed between 1972 and 1973. This State continued to be the site of R&D performance primarily for NASA and DOD, with both of these agencies prime users of industrial firms for aerospace, aircraft, and electronics work. Additionally, these agencies are engaged in important intramural activities in Texas, the most outstanding example being those at NASA's Manned Spacecraft Center in Houston.

New Jersey reflected the second greatest net loss in R&D support in 1973, in the amount of $118 million. The New Jersey share of total also dropped. Since DOD, notably the Army, accounts for more than four-fifths of the federally sponsored performance within the State, changes in DOD support strongly influence the total. In 1973 DOD intramural activity declined considerably from the 1972 level. The larger DOD installations in New Jersey include a cluster of Army communications and electronics laboratories at Fort Monmouth and the Picatinny Arsenal at Dover. At the same time DOD support to industrial firms also declined significantly in 1973, and NASA support to industry declined somewhat in connection with work on the space tracking and data acquisition network.

R&D obligations by geographic division and State, fiscal years 1963, 1968, 1972, and 1973

[Dollars in millions]

Division and State	1963	1968	1972	Net increase/ decrease 1963-72	1973	Net increase/ decrease 1972-73
Pacific	$4,665.2	$4,774.3	$4,158.2	−$507.0	$4,562.0	+$403.8
Alaska	12.1	61.8	46.0	+ 33.9	41.8	− 4.2
California	4,296.7	4,298.6	3,473.1	−823.6	3,840.1	+367.0
Hawaii	7.1	35.0	47.4	+ 40.3	47.9	+ .5
Oregon	18.2	35.0	53.7	+ 35.5	64.3	+ 10.6
Washington	331.1	343.9	537.9	+206.8	567.9	+ 30.0
South Atlantic	$1,683.3	$2,819.7	$3,560.6	+$1,875.8	$3,706.2	+$145.6
Delaware	24.6	13.9	17.4	− 7.2	40.8	+ 23.4
District of Columbia	403.9	443.2	462.1	+ 58.2	490.0	+ 27.9
Florida	340.9	799.1	1,022.5	+681.6	952.0	− 70.5
Georgia	26.7	280.7	71.9	+ 45.2	66.8	− 5.1
Maryland	675.7	905.9	1,318.1	+642.4	1,434.8	+116.7
North Carolina	27.0	62.4	83.3	+ 56.3	101.9	+ 18.6
South Carolina	19.8	18.7	26.3	+ 6.5	23.7	− 2.6
Virginia	158.8	275.2	529.6	+370.8	567.9	+ 38.3
West Virginia	7.9	20.6	29.4	+ 21.5	28.2	− 1.2
Middle Atlantic	$1,789.2	$2,473.4	$2,481.0	+$691.8	$2,206.7	−$274.3
New Jersey	410.1	681.8	763.1	+353.0	645.2	−117.9
New York	944.2	1,174.9	1,075.6	+131.4	932.6	−143.0
Pennsylvania	434.9	616.7	642.3	+207.4	628.8	− 13.5
Mountain	$1,068.6	$1,093.6	$1,214.4	+$145.8	$1,290.6	+$ 76.2
Arizona	174.6	71.4	89.9	− 84.7	94.8	+ 4.9
Colorado	240.8	265.3	369.1	+128.3	410.6	+ 41.7
Idaho	29.7	65.6	75.9	+ 46.2	81.8	+ 5.9
Montana	8.5	8.3	19.0	+ 10.5	19.9	+ .9
Nevada	128.9	223.6	140.3	+ 11.4	143.1	+ 2.8
New Mexico	345.9	413.3	451.5	+105.6	462.8	+ 11.3
Utah	135.8	39.7	58.9	− 76.9	66.7	+ 7.8
Wyoming	4.5	6.4	9.9	+ 5.4	10.7	+ .8
New England	$ 702.2	$1,009.4	$1,259.8	+$557.6	$1,264.4	+$ 4.6
Connecticut	139.3	133.2	169.2	+ 29.9	193.9	+ 24.7
Maine	5.3	6.0	16.3	+ 11.0	9.6	− 6.7
Massachusetts	515.1	795.7	961.2	+446.1	953.6	− 7.6
New Hampshire	16.9	36.6	21.5	+ 4.6	30.6	+ 9.1
Rhode Island	20.5	31.1	68.9	+ 48.4	59.3	− 9.6
Vermont	5.2	6.8	22.8	+ 17.6	17.5	− 5.3
East North Central	$ 819.5	$1,294.0	$1,179.6	+$360.1	$1,082.8	−$ 96.8
Illinois	203.9	239.3	291.0	+ 87.1	287.6	− 3.4
Indiana	57.3	82.9	100.5	+ 43.2	82.9	− 17.6
Michigan	154.4	203.4	186.3	+ 31.9	153.8	− 32.5
Ohio	304.3	653.6	521.7	+217.4	478.8	− 42.9
Wisconsin	99.7	114.8	80.1	− 19.6	79.6	− .5
West North Central	$ 376.7	$ 321.1	$ 906.0	+$529.3	$ 830.8	−$ 75.2
Iowa	23.3	41.7	37.9	+ 14.6	38.5	+ .6
Kansas	21.5	19.8	31.3	+ 9.8	30.4	− .9
Minnesota	73.6	111.1	127.0	+ 53.4	120.2	− 6.8
Missouri	236.6	121.1	679.5	+442.9	608.1	− 71.4

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North Dakota	3.4	6.0	10.5	+ 7.1	9.5	– 1.0
South Dakota	13.5	6.0	8.1	– 5.4	10.7	+ 2.6
West South Central	$ 608.2	$1,188.9	$ 798.8	+ $190.7	$ 794.0	– $ 4.9
Arkansas	4.2	8.1	13.2	+ 9.0	16.6	+ 3.4
Louisiana	189.2	272.4	103.6	– 85.6	91.6	– 12.0
Oklahoma	16.9	24.0	29.1	+ 12.2	34.8	+ 5.7
Texas	397.9	894.4	653.0	+ 255.1	651.0	– 2.0
East South Central	$ 420.1	$ 655.3	$ 638.9	+ $218.8	$ 681.5	+ $ 42.6
Alabama	246.8	405.7	359.0	+ 112.2	376.5	+ 17.5
Kentucky	11.0	24.1	32.1	+ 21.1	38.1	+ 6.0
Mississippi	16.5	26.5	60.7	+ 44.2	57.5	– 3.2
Tennessee	145.8	199.1	187.1	+ 41.3	209.5	+ 22.4

The amount of Federal support to **Pennsylvania** decreased only slightly in 1973 from 1972, and the share of this State within the Federal R&D total remained virtually the same. Approximately one-half of the Federal performance within Pennsylvania is undertaken for DOD, mostly for the Navy, and about one-sixth for AEC. In 1973 DOD increased industry contracts and decreased its own intramural obligations. AEC support to the Bettis Atomic Power Laboratory, an FFRDC, was increased in 1973 for work on naval reactor development as well as work on an advanced type of liquid water breeder reactor (LWBR).

In 1973 **Missouri** showed the third largest decrease of any State—$71 million—and its share of the Federal R&D total was reduced. Nine out of 10 Federal R&D dollars in Missouri are provided by DOD and NASA. An increase in DOD funds to both industry and intramural work was offset by a decrease in NASA obligations to industry for work on Skylab.

The 1973 increase of $38 million for **Virginia** was the fourth largest of any State. Here, also, virtually nine out of 10 dollars are directed to State performers by DOD and NASA, but the largest share of the workload is borne by intramural performance rather than industrial. For example, the Army maintains a group of laboratories at Fort Belvoir for work on mobility equipment, night vision and other problems, and the Navy supports the Naval Weapons Laboratory at Dahlgren. In 1973, however, the Virginia total was increased by additional DOD contracts to industry.

In 1973 **Washington** was in 11th place in terms of Federal R&D support, compared with 10th place in 1972. Nonetheless, a gain of $30 million was reflected by this State for industrial work on aircraft for DOD (the Air Force) and work for AEC at the Hanford Engineering Development Laboratory (an FFRDC) at Richland.

The **District of Columbia, Ohio, New Mexico,** and **Colorado** were in 12th place to 15th place, in that order, in 1973. Of these, the District of Columbia showed a gain, mostly for work in the intramural sector, New Mexico showed a slight gain, and Colorado showed the third highest gain of any State, at $42 million. In Colorado most of the increase was brought about by larger NASA contracts to industry, partly for work on the Viking Lander System. Ohio's decrease of $43 million in Federal R&D funding was the fifth highest of any State and could be traced principally to lower DOD (Air Force) obligations to industrial firms.

Distribution of Funds by Perform

- The major performing sectors repre
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Distribution of Funds by Performers

- The major performing sectors represent contrasting patterns by States. Various factors have led to the evolution of concentrations of industrial, academic, or Federal intramural competence within given States and to Federal use and support of these performer groups for R&D purposes. R&D capability, once demonstrated, tends to be used again so that certain States become established leaders for certain kinds of R&D performance. A number of States show leadership in more than one area (both industrial and academic, for example), and this situation is enhanced by the fact that one kind of R&D performer will often encourage the growth of other kinds in a supporting capacity.

INDUSTRY

Areas of industrial performance are for the most part separated geographically. For example, in 1973 California and Florida led in Federal R&D support to industry because the kind of industrial R&D capacity found within these States was particularly adaptable to military and/or space programs. The next three States in order of Federal use of industry were Missouri, New York, and New Jersey, which represent further geographical dispersion. These States also contain specialized industrial capabilities, largely in aircraft, aerospace, and electronic fields, that are applicable to large-scale Federal development programs.

The dispersed pattern is carried further by the next five States supported in 1973—Washington, Massachusetts, Maryland, Pennsylvania, and Texas.

More than 80 percent of Federal industrial R&D performance in 1973 was undertaken in the 10 States mentioned above. Considerable overlap is found between these "industrial" States and the 10 States leading in Federal use of *all* types of performers. The reason is clear: 51 percent of all Federal R&D work was accomplished by industrial firms (including FFRDC's) in 1973. The chief support agencies were DOD and NASA.

FEDERAL INTRAMURAL

Federal intramural performance, which represented 27 percent of all Federal R&D performance in 1973, reveals a different picture. Here, the leading States have a tendency to cluster along the Eastern seaboard, with some notable exceptions. The five leading States for intramural performance were Maryland, California, Virginia, Florida, and the District of Columbia. The fact that two of the leading States are contiguous with the District of Columbia is not surprising. The Federal R&D centers located in those States were placed close to administering agency headquarters. In the case of Florida and California, intramural performance centers were placed in advantageous positions for military and space testing or were economically located in relation to industrial R&D contractors.

An examination of the next five States in Federal intramural activity in 1973—Ohio, Alabama, Texas, New Mexico, and Massachusetts—reveals only one on the Atlantic coast plus two on the Gulf Coast and two inland.

The 10 leading States in Federal intramural performance accounted for approximately 75 percent of that performance in 1973, and they largely represented the R&D activities of DOD and NASA.

UNIVERSITIES AND COLLEGES

The chief areas of university-and-college capability are found in the coastal or the East North Central regions of the United States. California, New York, Massachusetts, Pennsylvania, and Illinois were the leading States in Federal R&D support to the academic sector in 1973. The leading agencies behind this support were HEW, NSF, and DOD. In the next five States—Texas, Maryland, Michigan, Ohio, and Wisconsin—the predominance of HEW was pronounced.

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The "leading 10" group accounted for 62 percent of all university-and-college R&D performance for Federal agencies in 1973. No one State predominated heavily. Performance by universities and colleges is more dispersed than in the case of industrial and Federal intramural performance. The university-and-college sector carried out 11 percent to 12 percent of all Federal R&D work in 1973.

UNIVERSITY-ADMINISTERED FFRDC's

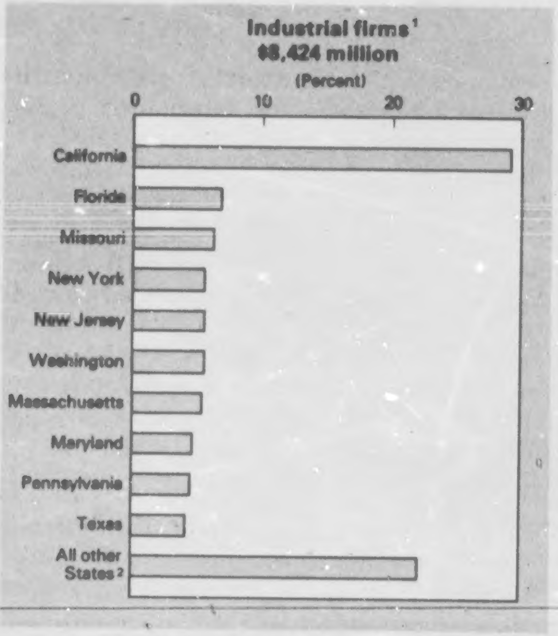
The FFRDC's administered by universities accounted for 4 percent of all Federal R&D work in 1973. In certain individual States, however, they stood out in importance. Among the 10 leading States for this sector were California, New Mexico, Illinois, Maryland, and Massachusetts. These States were selected for Federal R&D activities that required certain conditions like low population for explosive testing or availability of special kinds of expertise.

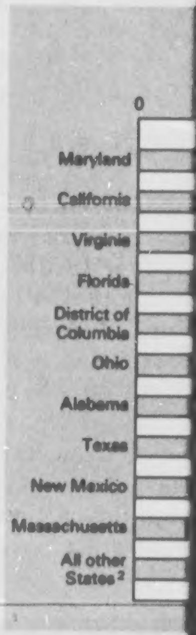
AEC is the leading support agency in four out of 10 of these States. The other support agencies were DOD, NSF, and NASA.

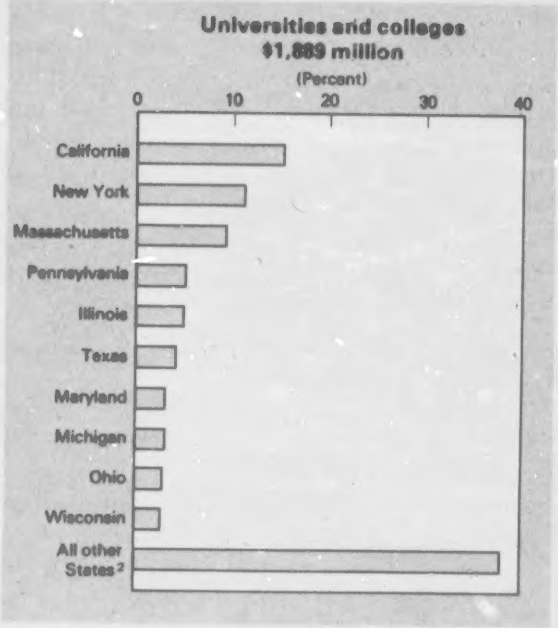
OTHER NONPROFIT INSTITUTIONS

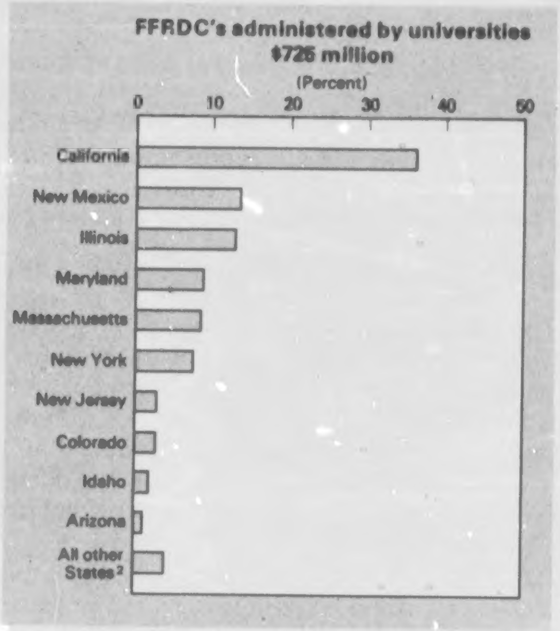
Other nonprofit institutions (including FFRDC's) made up less than 5 percent of the Federal R&D total in 1973. The "leading 10" group for this performance sector coincide with States previously mentioned.

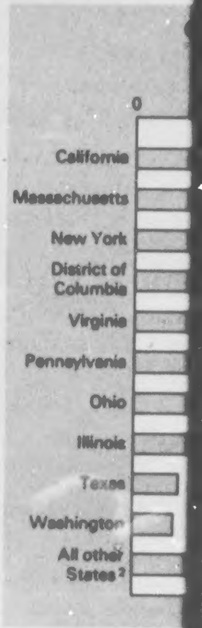
The 10 States leading in Federal R&D support to performing sectors, FY 1973


Industrial firms[1]
$8,424 million




Universities and colleges
$1,889 million


FFRDC's administered by universities
$726 million



[1] Includes FFRDC's administered by this sector.

[2] Includes outlying areas and offices abroad.

SOURCE: National Science Foundation

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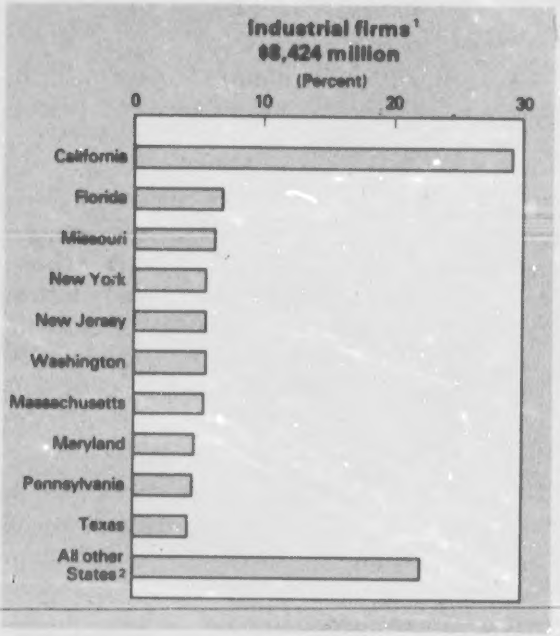

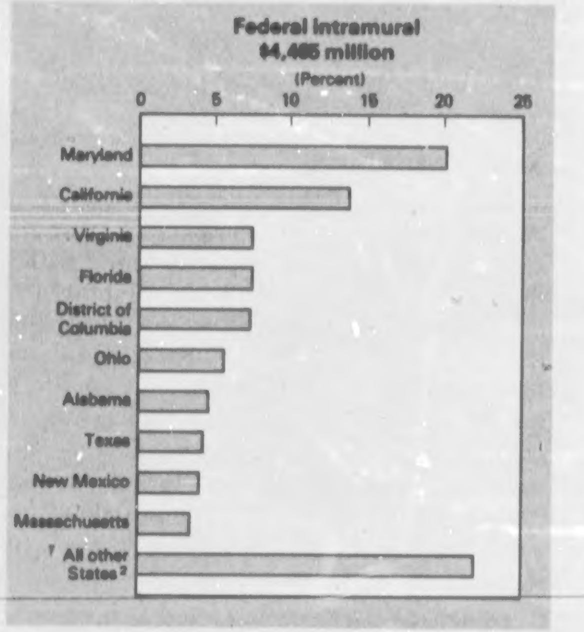

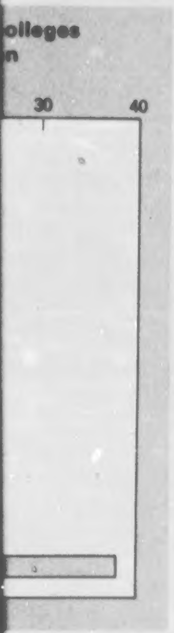

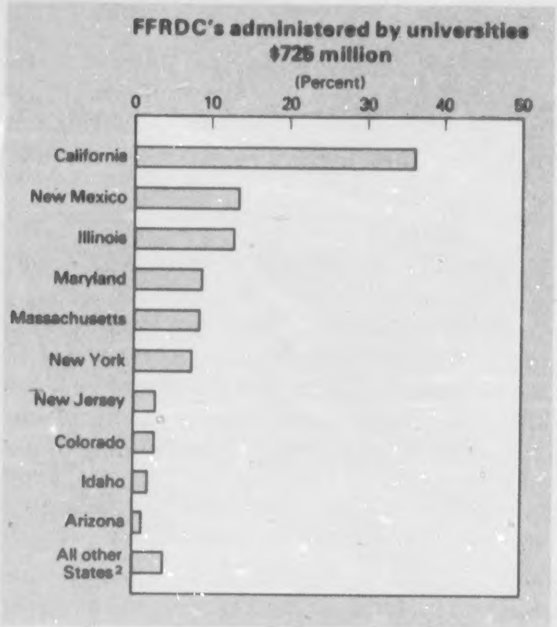

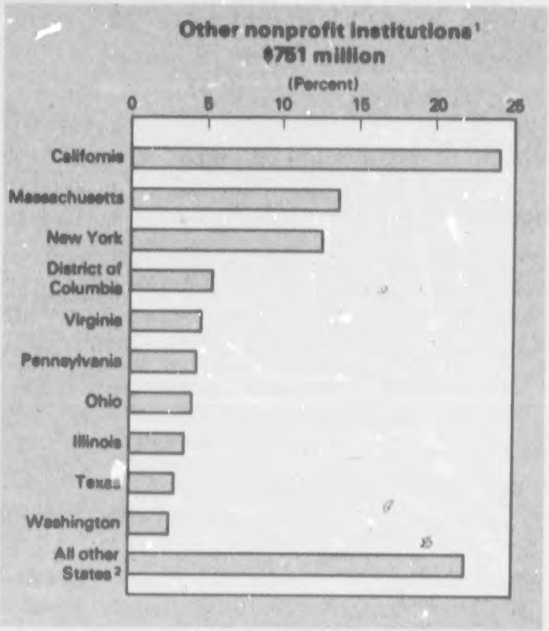

[2] Includes outlying areas and offices abroad.

SOURCE: National Science Foundation

R&D Plant

- Over the 1963-73 period the leading States in support of R&D plant have been made up of a group of 17 States. Five of them—California, Florida, New Mexico, Maryland, and New York—were among the leading 10 in each of the eight years surveyed.
- California remained in the lead in 1973 as had been the case in 1971 and 1972 and with approximately the same level of funding in each of those years. Chief support was furnished by DOD and AEC.
- In 1973 AEC was the chief source of support to R&D plant in Illinois, New York, New Mexico, Washington, and Tennessee. Each of these States contains FFRDC's under AEC sponsorship.
- Ohio appeared among the leading 10 States in 1973 as a result of large obligations for construction of the Environmental Control Laboratory in Cincinnati.

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Federal obligations for R&D plant in the 10 States leading in such support by agency, fiscal year 19

[Dollars in millions]

State	Total	AEC	DOD	NASA	NSF	HEW	DOT	Interior	Othe
Total	$758	$349	$146	$69	$56	$42	$38	$22	$36
California	128	46	52	20	3	3	3	—	1
Illinois	84	80	(3)	(3)	—	—	—	4	—
New York	82	67	1	3	—	7	—	2	2
New Mexico	52	42	7	(3)	3	—	—	—	—
Maryland	51	(3)	21	2	(3)	12	14	(3)	2
Washington	48	40	(3)	—	(3)	1	—	6	1
Florida	40	—	26	12	(3)	1	—	(3)	1
Ohio	39	5	8	2	—	—	—	1	22
Tennessee	37	35	2	(3)	—	—	—	—	—
District of Columbia	31	—	8	(3)	18	5	—	—	—
Other States[2]	166	34	21	30	32	13	21	9	

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[1] Includes the Departments of Agriculture and Commerce, and Environmental Protection Agency.

[2] Includes outlying areas and offices abroad.

[3] Less than $500,000.

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- In 1973 AEC was the chief source of support to R&D plant in Illinois, New York, New Mexico, Washington, and Tennessee. Each of these States contains FFRDC's under AEC sponsorship.
- Ohio appeared among the leading 10 States in 1973 as a result of large obligations for construction of the Environmental Control Laboratory in Cincinnati.

Factors in R&D Performing Strength

R&D obligations can be ranked by State and compared with such measures of national activity as population, total personal income, and total Federal taxes. Although no direct cause and effect relationships can be drawn, the data tend to indicate that the wider choice of skills and institutions found in more populous and wealth-producing areas is related to the selection of those areas for R&D performance.

eral obligations for R&D plant in the 10 States leading in such support, by agency, fiscal year 1973

[Dollars in millions]

State	Total	AEC	DOD	NASA	NSF	HEW	DOT	Interior	Other[1]
otal	$758	$349	$146	$69	$56	$42	$38	$22	$36
fornia	128	46	52	20	3	3	3	—	1
ois	84	80	(3)	(3)	—	—	—	4	—
w York	82	67	1	3	—	7	—	2	2
w Mexico	52	42	7	(3)	3	—	—	—	—
ryland	51	(3)	21	2	(3)	12	14	(3)	2
shington	48	40	(3)	—	(3)	1	—	6	1
ida	40	—	26	12	(3)	1	—	(3)	1
o	39	5	8	2	—	—	—	1	23
nnessee	37	35	2	(3)	—	—	—	—	—
trict of Columbia	31	—	8	(3)	18	5	—	—	—
er States[2]	166	34	21	30	32	13	21	9	6

udes the Departments of Agriculture and Commerce, and Environmental Protection Agency.

udes outlying areas and offices abroad.

than $500,000.

Distribution of Federal R&D obligations by State compared with other national indicators, by State, FY 1973

State	Total Federal R&D obligations		Population		Total personal income		Total Federal taxes[1]	
	Rank	Percent of total	Rank	Percent of total	Rank	Percent of total	Rank	Percent of total
United States total (in millions)	$16,486		[2]210		$1,032,045		$210,447	
California	1	23.29	1	9.82	1	10.86	2	8.54
Maryland	2	8.70	18	1.94	15	2.10	9	2.89
Massachusetts	3	5.78	10	2.77	10	2.95	10	2.73
Florida	4	5.78	8	3.66	9	3.46	11	2.73
New York	5	5.66	2	8.70	2	10.02	1	14.46
Texas	6	3.95	4	5.62	6	4.96	7	5.04
New Jersey	7	3.91	9	3.51	8	4.11	8	3.71
Pennsylvania	8	3.81	3	5.67	4	5.64	6	5.99
Missouri	9	3.69	15	2.27	13	2.15	12	2.65
Virginia	10	3.45	13	2.29	12	2.20	20	1.59
Washington	11	3.45	22	1.63	20	1.66	22	1.18
District of Columbia	12	2.97	43	.36	36	.49	(3)	(3)
Ohio	13	2.91	6	5.11	5	5.21	5	6.07
New Mexico	14	2.81	37	.53	40	.40	44	.21
Colorado	15	2.49	28	1.16	26	1.19	19	1.60
Alabama	16	2.28	21	1.69	25	1.28	27	.82
Illinois	17	1.75	5	5.35	3	6.26	3	7.65
Tennessee	18	1.27	17	1.97	21	1.58	23	1.17
Connecticut	19	1.18	24	1.47	19	1.76	14	2.29
Michigan	20	.93	7	4.31	7	4.77	4	6.51
Nevada	21	.87	48	.26	47	.30	43	.23
Minnesota	22	.73	19	1.86	18	1.86	16	1.93
North Carolina	23	.62	12	2.51	14	2.11	15	2.26
Arizona	24	.58	32	.98	31	.90	33	.57
Louisiana	25	.56	20	1.79	22	1.39	24	.93
Indiana	26	.50	11	2.53	11	2.53	13	2.37
Idaho	27	.50	42	.37	43	.32	41	.24
Wisconsin	28	.48	16	2.18	16	2.05	17	1.86
Georgia	29	.41	14	2.28	17	1.97	18	1.73
Utah	30	.41	36	.55	38	.45	39	.26
Oregon	31	.39	31	1.06	29	1.01	28	.80
Rhode Island	32	.36	39	.46	37	.45	34	.44
Mississippi	33	.35	29	1.09	32	.76	36	.36
Hawaii	34	.29	40	.40	39	.43	38	.30
Alaska	35	.25	51	.16	50	.18	49	.09
Delaware	36	.25	47	.27	44	.31	30	.64
Iowa	37	.23	25	1.38	23	1.37	26	.82
Kentucky	38	.23	23	1.59	24	1.28	21	1.37
Oklahoma	39	.21	27	1.27	28	1.08	25	.93
New Hampshire	40	.19	41	.38	42	.35	40	.24
Kansas	41	.18	30	1.09	27	1.12	29	.70
West Virginia	42	.17	34	.85	35	.67	37	.30
South Carolina	43	.14	26	1.30	30	1.01	32	.59
Montana	44	.12	44	.34	45	.31	45	.15
Vermont	45	.11	49	.22	49	.18	48	.12

Texas	6	3.95	4	5.62	6	4.96	7	5.04
New Jersey	7	3.91	9	3.51	8	4.11	8	3.71
Pennsylvania	8	3.81	3	5.67	4	5.64	6	5.99
Missouri	9	3.69	15	2.27	13	2.15	12	2.65
Virginia	10	3.45	13	2.29	12	2.20	20	1.59
Washington	11	3.45	22	1.63	20	1.66	22	1.18
District of Columbia	12	2.97	43	.36	36	.49	(3)	(3)
Ohio	13	2.91	6	5.11	5	5.21	5	6.07
New Mexico	14	2.81	37	.53	40	.40	44	.21
Colorado	15	2.49	28	1.16	26	1.19	19	1.60
Alabama	16	2.28	21	1.69	25	1.28	27	.82
Illinois	17	1.75	5	5.35	3	6.26	3	7.65
Tennessee	18	1.27	17	1.97	21	1.58	23	1.17
Connecticut	19	1.18	24	1.47	19	1.76	14	2.29
Michigan	20	.93	7	4.31	7	4.77	4	6.51
Nevada	21	.87	48	.26	47	.30	43	.23
Minnesota	22	.73	19	1.86	18	1.86	16	1.93
North Carolina	23	.62	12	2.51	14	2.11	15	2.26
Arizona	24	.58	32	.98	31	.90	33	.57
Louisiana	25	.56	20	1.79	22	1.39	24	.93
Indiana	26	.50	11	2.53	11	2.53	13	2.37
Idaho	27	.50	42	.37	43	.32	41	.24
Wisconsin	28	.48	16	2.18	16	2.05	17	1.86
Georgia	29	.41	14	2.28	17	1.97	18	1.73
Utah	30	.41	36	.55	38	.45	39	.26
Oregon	31	.39	31	1.06	29	1.01	28	.80
Rhode Island	32	.36	39	.46	37	.45	34	.44
Mississippi	33	.35	29	1.09	32	.76	36	.36
Hawaii	34	.29	40	.40	39	.43	38	.30
Alaska	35	.25	51	.16	50	.18	49	.09
Delaware	36	.25	47	.27	44	.31	30	.64
Iowa	37	.23	25	1.38	23	1.37	26	.82
Kentucky	38	.23	23	1.59	24	1.28	21	1.37
Oklahoma	39	.21	27	1.27	28	1.08	25	.93
New Hampshire	40	[illegible]	41	.38	42	.35	40	.24
Kansas	41	.18	30	1.09	27	1.12	29	.70
West Virginia	42	.17	34	.85	35	.67	37	.30
South Carolina	43	.14	26	1.30	30	1.01	32	.59
Montana	44	.12	44	.34	45	.31	45	.15
Vermont	45	.11	49	.22	49	.18	48	.12
Arkansas	46	.10	33	.97	33	.73	35	.36
Nebraska	47	.08	35	.73	34	.72	31	.62
South Dakota	48	.07	45	.33	48	.29	46	.13
Wyoming	49	.07	50	.17	51	.16	50	.09
Maine	50	.06	38	.49	41	.39	42	.23
North Dakota	51	.06	46	.30	46	.30	47	.12
Outlying areas and offices abroad		.41	—	—	—	—	—	4.40[4]

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[1] Includes individual income and employment taxes, corporation income, excise, estate and gift taxes (minus refunds).

[2] Provisional estimate of resident population as of July 1, 1973 (209,851,000).

[3] Included in Maryland tax figures.

[4] Collections from and refunds to U.S. taxpayers in Puerto Rico, Canal Zone, and in foreign countries.

SOURCES: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-25, No. 520, July 1974; U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Volume 54, No. 4, April 1974; U.S. Department of the Treasury, *Statistical Appendix to Annual Report of the Secretary of the Treasury on the State of the Finances for the Fiscal Year Ended June 30, 1973.*

Impact of Subcontracting

As previously noted, data on geographic distribution in this report are based on the location of prime contractors performing R&D work. Therefore, they do not reflect the redistribution of Federal R&D funds among the States as a result of subcontracting. Data on NASA subcontracting are provided to gain some insight on the impact of such subcontracting.

The NASA data represent information on all first-tier subcontracts in excess of $10,000 on each of the agency's prime contracts in excess of $500,000 and on second-tier subcontracts in excess of $10,000 on each of the first-tier subcontracts in excess of $50,000.

The NASA data indicate that significant redistribution of R&D funds among States would be disclosed by the availability of full subcontracting data from all agencies. The support to the leading R&D support States would tend to decrease somewhat (although the net change would be small in relation to their prime contracts), but in the case of many smaller support States, the net increase from subcontracts would be important in relation to prime contracts awarded.

NASA

- NASA subcontracts in 1973 totaled $348 million. Of this total, $122 million, or 35 percent, remained within the prime contract State, and $226 million, or 65 percent, crossed State lines.
- These subcontract dollars originated from prime contracts in 25 States, although the subcontracts were performed in 42 States and the District of Columbia.
- As a result, 32 States and the District of Columbia showed an increase in their share of procurements, and 10 States showed a decrease.
- Six of the 10 States showing decreases resulting from subcontracting were among the leading seven States in 1973 prime contract awards.

U.S. geographical distribution of NASA prime contract and subcontract awards, fiscal year 1973

[Dollars in thousands]

States	Prime contract awards to States		Subcontract awards			Net total – prime contract and subcontract awards	
	Amount	Percent of total	Received from other States	Awarded to other States	Net total	Amount[3]	Percent of total
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
TOTAL	$2,115,644	100.0	$226,252	$226,252	$ —	$2,115,644	100.0
Alabama	106,042	5.0	2,557	3,945	[2](1,388)	104,654	4.9
Alaska	1,718	0.1	102	—	102	1,820	0.1
Arizona	6,956	0.3	13,861	552	13,309	20,265	1.0
Arkansas	87	(1)	14	—	14	101	(1)
California	696,005	32.9	57,208	96,612	[2](35,404)	660,601	31.2
Colorado	194,400	9.2	9,179	39,064	[2](29,885)	164,515	7.8
Connecticut	21,711	1.0	10,134	1,836	8,298	30,009	1.4
Delaware	4,300	0.2	33	31	2	4,302	0.2
District of Columbia	11,671	0.6	11	—	11	11,682	0.6
Florida	215,112	10.2	15,858	2,141	13,717	228,829	10.8
Georgia	5,206	0.2	52	—	52	5,258	0.2
Hawaii	2,100	0.1	—	—	—	2,100	0.1
Idaho	34	(1)	—	—	—	34	(1)
Illinois	8,357	0.4	850	—	850	9,207	0.4
Indiana	5,601	0.3	243	608	[2](365)	5,236	0.2
Iowa	4,072	0.2	133	554	[2](421)	3,651	0.2
Kansas	1,600	0.1	29	—	29	1,629	0.1
Kentucky	147	(1)	—	—	—	147	(1)
Louisiana	49,812	2.4	172	93	79	49,891	2.4
Maine	[2](21)	(1)	—	—	—	[2](21)	(1)
Maryland	181,801	8.6	3,464	30,017	[2](26,553)	155,248	7.3
Massachusetts	47,164	2.2	16,271	1,483	14,788	61,952	2.9
Michigan	10,483	0.5	3,170	1,478	1,692	12,175	0.6
Minnesota	10,578	0.5	8,981	39	8,942	19,520	0.9
Mississippi	13,230	0.6	243	1,218	[2](975)	12,255	0.6
Missouri	111,855	5.3	7,855	14,746	[2](6,891)	104,964	5.0
Montana	104	(1)	—	—	—	104	(1)
Nebraska	286	(1)	136	—	136	422	(1)
Nevada	578	(1)	34	—	34	612	(1)
New Hampshire	979	(1)	223	—	223	1,202	(1)
New Jersey	36,065	1.7	12,943	14,529	[2](1,586)	34,479	1.6
New Mexico	4,260	0.2	396	—	396	4,656	0.2
New York	45,193	2.1	15,999	3,211	12,788	57,981	2.7
North Carolina	1,637	0.1	178	—	178	1,815	0.1
North Dakota	—	—	—	—	—	—	—
Ohio	21,278	1.0	2,327	316	2,011	23,289	1.1
Oklahoma	997	(1)	231	—	231	1,228	0.1
Oregon	1,107	0.1	191	—	191	1,298	0.1
Pennsylvania	46,926	2.2	9,075	4,137	4,938	51,864	2.5
Rhode Island	312	(1)	51	—	51	363	(1)
South Carolina	316	(1)	214	—	214	530	(1)
South Dakota	335	(1)	—	—	—	335	(1)

Arkansas	87	(1)	14	—	14	101	(1)
California	696,005	32.9	57,208	96,612	2(35,404)	660,601	31.2
Colorado	194,400	9.2	9,179	39,064	2(29,885)	164,515	7.8
Connecticut	21,711	1.0	10,134	1,836	8,298	30,009	1.4
Delaware	4,300	0.2	33	31	2	4,302	0.2
District of Columbia	11,671	0.6	11	—	11	11,682	0.6
Florida	215,112	10.2	15,858	2,141	13,717	228,829	10.8
Georgia	5,206	0.2	52	—	52	5,258	0.2
Hawaii	2,100	0.1	—	—	—	2,100	0.1
Idaho	34	(1)	—	—	—	34	(1)
Illinois	8,357	0.4	850	—	850	9,207	0.4
Indiana	5,601	0.3	243	608	2(365)	5,236	0.2
Iowa	4,072	0.2	133	554	2(421)	3,651	0.2
Kansas	1,600	0.1	29	—	29	1,629	0.1
Kentucky	147	(1)	—	—	—	147	(1)
Louisiana	49,812	2.4	172	93	79	49,891	2.4
Maine	2(21)	(1)	—	—	—	2(21)	(1)
Maryland	181,801	8.6	3,464	30,017	2(26,553)	155,248	7.3
Massachusetts	47,164	2.2	16,271	1,483	14,788	61,952	2.9
Michigan	10,483	0.5	3,170	1,478	1,692	12,175	0.6
Minnesota	10,578	0.5	8,981	39	8,942	19,520	0.9
Mississippi	13,230	0.6	243	1,218	2(975)	12,255	0.6
Missouri	111,855	5.3	7,855	14,746	2(6,891)	104,964	5.0
Montana	104	(1)	—	—	—	104	(1)
Nebraska	286	(1)	136	—	136	422	(1)
Nevada	578	(1)	34	—	34	612	(1)
New Hampshire	979	(1)	223	—	223	1,202	(1)
New Jersey	36,065	1.7	12,943	14,529	2(1,586)	34,479	1.6
New Mexico	4,260	0.2	396	—	396	4,656	0.2
New York	45,193	2.1	15,999	3,211	12,788	57,981	2.7
North Carolina	1,637	0.1	178	—	178	1,815	0.1
North Dakota	—	—	—	—	—	—	—
Ohio	21,278	1.0	2,327	316	2,011	23,289	1.1
Oklahoma	997	(1)	231	—	231	1,228	0.1
Oregon	1,107	0.1	191	—	191	1,298	0.1
Pennsylvania	46,926	2.2	9,075	4,137	4,938	51,864	2.5
Rhode Island	312	(1)	51	—	51	363	(1)
South Carolina	316	(1)	214	—	214	530	(1)
South Dakota	335	(1)	—	—	—	335	(1)
Tennessee	1,708	0.1	18	—	18	1,726	0.1
Texas	180,376	8.5	8,530	6,306	2,624	183,000	8.6
Utah	1,259	0.1	2,465	831	1,634	2,893	0.1
Vermont	153	(1)	162	—	162	315	(1)
Virginia	44,213	2.1	833	3,627	2(2,794)	41,419	2.0
Washington	13,322	0.6	20,589	2,372	18,217	31,539	1,5
West Virginia	147	(1)	13	—	13	160	(1)
Wisconsin	3,854	0.2	824	506	318	4,172	0.2
Wyoming	218	(1)	—	—	—	218	(1)

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[1] Less than .05 percent.

[2] The awards *to* other States exceed the awards *from* other States.

[3] Column (b) plus or minus column (f).

NOTE: Prime contract awards include awards on R&D contracts and awards to educational and nonprofit institutions of $10,000 and over and on all other contracts of $25,000 and over; exclude awards placed through other Government agencies, awards outside the U.S., and actions on the JPL contracts. Subcontract awards include those of $10,000 and over on prime contracts of $500,000 and over.

SOURCE: National Aeronautics and Space Administration, Office of Procurement, *Annual Procurement Report, Fiscal Year 1973,* Washington, D.C. 20546

Part II

FEDERAL FUNDS FOR SCIENTIFIC AND TECHNICAL INFORMATION

Scientific and technical information (
or data resulting from the conduct of re
required for organizing, administering,
development. Such information is used
engineers engaged in R&D work.

S&TI activities cover a broad rang
distribution; documentation, reference
symposia and audiovisual communicati
information sciences. This last category
activities reported in part I of this survey

The data on S&TI in *Federal Funds*
S&TI obligations of Federal agencies; S&T
and grants are specifically excluded. It
totals in this report only partly reflect the
the Federal Government.

• Despite this limitation, the broad mea
on a functional basis can be useful as a gu

Part II

FEDERAL FUNDS FOR SCIENTIFIC AND TECHNICAL INFORMATION

Scientific and technical information (S&TI) is defined as knowledge or data resulting from the conduct of research and development, or required for organizing, administering, or performing research and development. Such information is used largely by scientists and engineers engaged in R&D work.

S&TI activities cover a broad range, including publication and distribution; documentation, reference and information services; symposia and audiovisual communication; and R&D work in the information sciences. This last category directly overlaps the R&D activities reported in part I of this survey.

The data on S&TI in *Federal Funds* surveys include only *direct* S&TI obligations of Federal agencies; S&TI costs under R&D contracts and grants are specifically excluded. It follows, therefore, that the totals in this report only partly reflect the S&TI activities supported by the Federal Government.

Despite this limitation, the broad measurement of direct S&TI costs on a functional basis can be useful as a guide to analysis and planning.

AGENCIES AND ACTIVITIES

- Growth continued in S&TI funding in the current (1973-75) period. The estimated increase in 1974 was greater than that anticipated for 1975, however.

- Despite almost no net change between 1973 and 1975, DOD remains well in the lead in S&TI support. The next two agencies in size of support—Commerce and HEW—reflect considerable gains between 1973 and 1975.

Federal obligations for scientific and technical information, by agency

[Dollars in millions]

Agency	Actual	Estimates			
	1973	1974	Percent change 1973-74	1975	Percent change 1974-75
Total	$437.9	$467.9	+ 6.9	$485.0	+ 3.7
Department of Defense	161.1	157.6	− 2.2	161.8	+ 2.7
Department of Commerce	84.6	93.0	+ 9.9	100.8	+ 8.4
Department of Health, Education, and Welfare	66.7	82.3	+23.4	81.2	− 1.3
Library of Congress	32.5	34.8	+ 7.1	36.1	+ 3.7
Department of the Interior	16.1	20.6	+28.0	25.6	+24.3
National Aeronautics and Space Administration	24.7	24.4	− 1.2	25.0	+ 2.5
Department of Agriculture	12.6	13.0	+ 3.2	13.4	+ 3.1
National Science Foundation	10.7	10.2	− 4.7	7.3	−28.4
Other agencies	28.9	32.0	+10.7	33.8	+ 5.6

Trends

- Between 1960 and 1975 federally funded S&TI activities expanded more than six times.

- In 1975 S&TI obligations were expected to be equal to 2½ percent of total Federal R&D obligations.

- The greatest S&TI increase in absolute t
tation, reference, and information servic
expected to account for 46 percent of the
37 percent in 1960.

- Conversely, the funding for publication
largest S&TI category, is expected to ma
total, against 49 percent in 1960. Even
category has been substantial.

- Research and development in informati
largest S&TI category—an estimated 16
compared with 4 percent in 1960. Thi
growth in the current (1973-75) period, b
1975 is the most extreme of any of the c

- Symposia and audiovisual media will
percent of the S&TI total in 1975, compa

**Trends in Federal obligations for scientifi
activities, by major ca**

[Dollars in millions

Fiscal Year	Total	Publication and distribution	Docu tion, enc infor ser
1960	$ 75.9	$ 37.0	$
1961	91.6	48.7	
1962	128.5	56.7	
1963	164.5	67.7	
1964	[1]203.2	59.9	
1965	224.7	68.2	1
1966	277.7	82.7	1
1967	324.4	87.1	1
1968	369.2	100.7	
1969	362.5	96.0	
1970	386.8	98.9	
1971	397.6	106.0	
1972	419.4	116.6	
1973	437.9	122.6	
1974 (est.)	467.9	131.6	
1975 (est.)	485.0	141.0	

[1] Includes $17.2 million for management, which was reported se

TIVITIES

ling in the current (1973-75) period.
was greater than that anticipated for

etween 1973 and 1975, DOD remains
rt. The next two agencies in size of
—reflect considerable gains between

and technical information, by agency

s in millions]

ctual	Estimates			
973	1974	Percent change 1973-74	1975	Percent change 1974-75
37.9	$467.9	+ 6.9	$485.0	+ 3.7
61.1	157.6	− 2.2	161.8	+ 2.7
84.6	93.0	+ 9.9	100.8	+ 8.4
66.7	82.3	+23.4	81.2	− 1.3
32.5	34.8	+ 7.1	36.1	+ 3.7
16.1	20.6	+28.0	25.6	+24.3
24.7	24.4	− 1.2	25.0	+ 2.5
12.6	13.0	+ 3.2	13.4	+ 3.1
10.7	10.2	− 4.7	7.3	−28.4
28.9	32.0	+10.7	33.8	+ 5.6

lly funded S&TI activities expanded

xpected to be equal to 2½ percent of

- The greatest S&TI increase in absolute terms has been for documentation, reference, and information services. This category in 1975 is expected to account for 46 percent of the S&TI total, compared with 37 percent in 1960.
- Conversely, the funding for publication and distribution, the second largest S&TI category, is expected to make up 29 percent of the 1975 total, against 49 percent in 1960. Even so, dollar growth for this category has been substantial.
- Research and development in information sciences is now the third largest S&TI category—an estimated 16 percent of the 1975 total—compared with 4 percent in 1960. This area of activity shows no growth in the current (1973-75) period, but the increase from 1960 to 1975 is the most extreme of any of the categories.
- Symposia and audiovisual media will account for an estimated 9 percent of the S&TI total in 1975, compared with 10 percent in 1960.

Trends in Federal obligations for scientific and technical information activities, by major categories

[Dollars in millions]

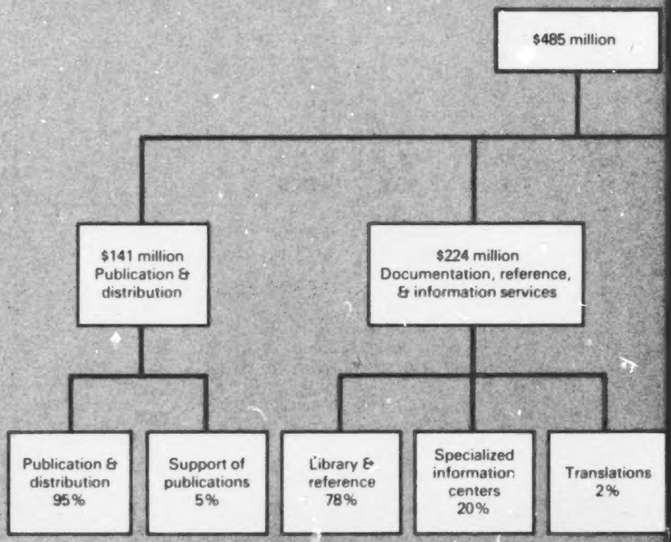
Fiscal Year	Total	Publication and distribution	Documentation, reference and information services	Symposia and audiovisual media	R&D in information sciences, documentation and information systems, techniques and devices
1960	$ 75.9	$ 37.0	$ 28.4	$ 7.6	$ 2.9
1961	91.6	48.7	29.0	6.7	7.2
1962	128.5	55.7	42.4	17.0	13.3
1963	164.5	67.7	64.0	21.0	11.9
1964	[1]203.2	59.9	90.8	22.7	12.6
1965	224.7	68.2	102.0	32.0	22.5
1966	277.7	82.7	124.6	22.5	48.0
1967	324.4	87.1	152.5	31.7	53.1
1968	359.2	100.7	165.6	34.1	58.8
1969	362.5	96.0	170.9	31.8	63.7
1970	386.8	98.9	198.1	32.6	62.1
1971	397.6	106.0	193.8	32.8	65.0
1972	419.4	116.6	196.5	36.5	69.7
1973	437.9	122.6	198.0	37.9	79.4
1974 (est.) . . .	467.9	131.6	217.0	40.4	78.9
1975 (est.) . . .	485.0	141.0	224.2	42.1	77.6

[1] Includes $17.2 million for management, which was reported separately from the other categories in 1964 only.

Categories

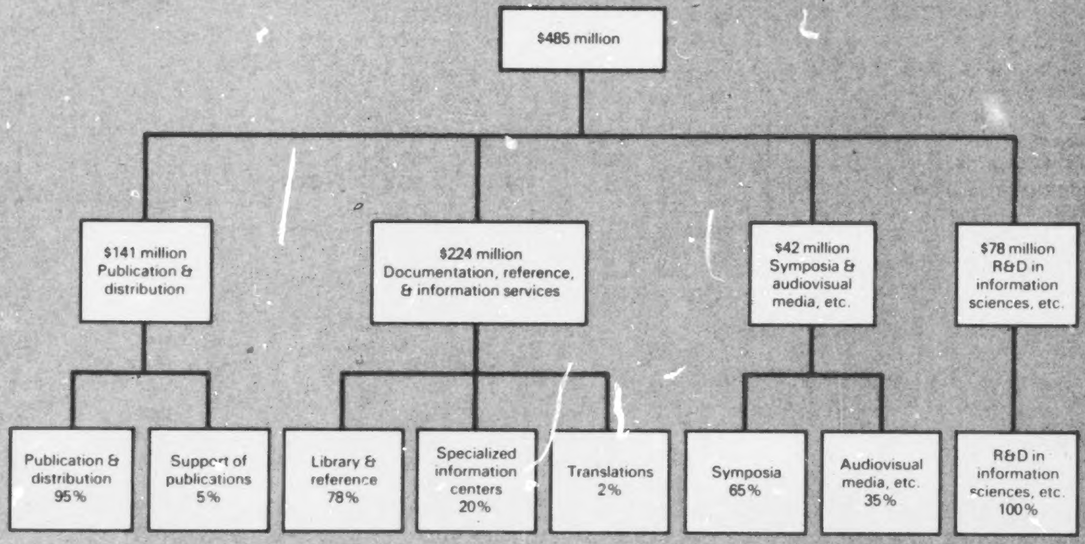
- Under each major category one subcategory accounts for most of the costs. This pattern has been consistent throughout the 1960-75 period.
- For publication and distribution, in 1975 more than nine out of ten dollars are allocated to direct costs of this function.
- For documentation, reference, and information services, library and reference accounts for almost four out of five dollars.
- Under symposia and audiovisual media, symposia and technical meetings lay claim on almost two out of three dollars.

Federal obligations for scientific and tech
FY 1975 (est.)


$485 million
$141 million Publication & distribution
$224 million Documentation, reference, & information services
Publication & distribution 95%
Support of publications 5%
Library & reference 78%
Specialized information centers 20%
Translations 2%

SOURCE: National Science Foundation

Federal obligations for scientific and technical information by activity, FY 1975 (est.)


$485 million
$141 million Publication & distribution
$224 million Documentation, reference, & information services
$42 million Symposia & audiovisual media, etc.
$78 million R&D in information sciences, etc.
Publication & distribution 95%
Support of publications 5%
Library & reference 78%
Specialized information centers 20%
Translations 2%
Symposia 65%
Audiovisual media, etc. 35%
R&D in information sciences, etc. 100%

SOURCE: National Science Foundation

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Agencies

- Although 22 agencies reported S&TI activities for 1975, the leading 12 account for more than 98 percent of the total dollars obligated.
- S&TI costs are not wholly comparable among agencies; some agencies have full reporting systems while others lack the means for capturing all their S&TI costs. In the 1973-75 period, 13 agencies reported no S&TI obligations despite reporting R&D programs. In some cases agencies cannot identify S&TI costs; in others, all such costs are incurred under extramural R&D contracts and grants.
- The ratio of S&TI obligations to the R&D obligations of an agency varies widely from one agency to another. Only in some cases do S&TI efforts bear a direct relationship to an agency's R&D work. They often represent independent services, such as those of the Patent Office within Commerce, the National Agricultural Library within USDA or the S&TI activities of the Library of Congress.
- DOD, HEW, and Commerce together account for 71 percent of the S&TI total in 1975.
- DOD will account for an estimated 33 percent of total Federal S&TI obligations in 1975, as much a reflection of the Army's S&TI reporting systems as any other factor. Although Navy and Air Force R&D program totals are larger than that of the Army, their reported S&TI totals are lower. The Defense Agencies represent a substantial portion of the DOD total, largely because they include the Defense Documentation Center.

Distribution of Federal obligations for scientific and technical information, by agency and subdivision, fiscal year 1975 (est.)

[Dollars in millions]

Agency and subdivision	Total obligations	Percent
Total, all agencies	$485.0	100.0
Department of Defense	161.8	33.4
Department of the Army	69.7	14.4
Department of the Navy	17.9	3.7
Department of the Air Force	24.6	5.1
Defense Agencies	49.5	10.2
Department of Commerce	100.8	20.8
Patent Office	73.6	15.2
National Technical Information Service	11.7	2.4
National Bureau of Standards	9.5	2.0
National Oceanic and Atmospheric Administration	4.8	1.0
Other	1.2	.2
Department of Health, Education, and Welfare	81.2	16.7
National Institutes of Health	58.6	12.1
(National Library of Medicine)	(28.0)	(5.8)
Alcohol, Drug Abuse, and Mental Health Administration	11.0	2.3
Health Resources Administration	4.6	.9
Food and Drug Administration	4.4	.9
Library of Congress	36.1	7.4
Department of the Interior	25.6	5.3
Geological Survey	18.3	3.8
Other	7.3	1.5
National Aeronautics and Space Administration	25.0	5.2
Department of Agriculture	13.4	2.8
National Agricultural Library	4.9	1.0
Forest Service	3.9	.8
Agricultural Research Service	3.6	.7
Other	1.0	.2
National Science Foundation	7.3	1.5
Atomic Energy Commission	7.0	1.4
Veterans Administration	6.6	1.4
Department of Transportation	6.0	1.2
Smithsonian Institution	5.6	1.2
Other agencies	8.6	1.8

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Other	1.0	.2
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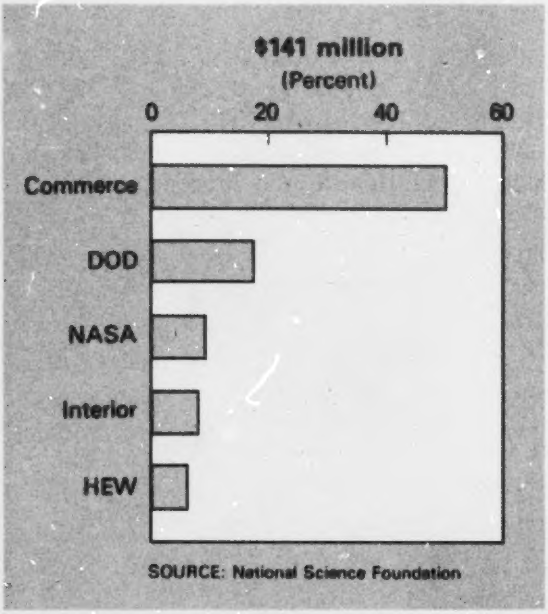
Atomic Energy Commission	7.0	1.4
Veterans Administration	6.6	1.4
Department of Transportation	6.0	1.2
Smithsonian Institution	5.6	1.2
Other agencies	8.6	1.8

- The gain in 1975 in funding for Commerce is the largest absolutely and reflects increased publication costs for the Patent Office. In 1975 Commerce is expected to represent 21 percent of the S&TI total.
- HEW will make up 17 percent of the Federal S&TI total in 1975; almost three-fourths of this effort is in the National Institutes of Health, the larger part in the National Library of Medicine.
- Interior reflects the largest relative increase in 1975, mostly for the Geological Survey with higher costs in all categories.
- NASA and AEC, despite large overall R&D programs, report comparatively small amounts for S&TI purposes because so much of their R&D work, including S&TI activities connected therewith, is performed extramurally.

Activities

- Certain agencies tend to be predominant in certain categories of S&TI activity. Although DOD reports considerable activity in all four major categories, HEW is active in three, NASA in two, and Commerce in two.
- S&TI functions tend to flow back and forth between categories. Often an agency will initiate S&TI activities in one category, or subcategory, and as its R&D programs grow, extend into the other categories.

Category 1. Publication and Distribution



SOURCE: National Science Foundation

COMMERCE: Patent Office
70,800 patents in FY 1975 (est.)
Official Gazette, weekly abstracts of current patents

DOD: Departments of the Army, Navy, and Air Force
Journal articles
Technical reports
Technical notes
Technical memorandums
Contractors' and grantees' reports
Research reviews
Research bulletins
Research reports
Newsletters
Surveys
Monographs
Proceedings of symposia
Handbooks
Books
Abstracts and bibliographies

NASA
Journal articles
Technical reports, notes, and memorandums
Contractors' reports
Conference proceedings
Scientific and Technical Abstracts (STAR)
International Aerospace Abstracts
Indexes
Bibliographies
Technical reprints
Special publications

INTERIOR: Geological Survey
Books
Maps
Charts
Atlases
Research summaries
Journal articles
Bibliography of North American Geology
Geophysical Abstracts

HEW: National Institutes of Health
Journals of the institutes
Journal articles
Indexes
Bibliographies
Abstracts
Monographs
Books
Reports
Alcohol, Drug Abuse, and Mental Health Administration
Scientific and technical papers
Manuals
Reviews and analyses
Journal articles
Office of Education
Research in Education

USDA
Papers
Bulletins
Reports
Periodicals

AEC
Technical reports
Progress reports
Summary reports
Topical reports
Journal articles
Proceedings of meetings
Nuclear Science Abstracts
Progress reviews
Books
Monographs
Bibliographies

- Contractors' reports
- Conference proceedings
- *Scientific and Technical Abstracts (STAR)*
- *International Aerospace Abstracts*
- Indexes
- Bibliographies
- Technical reprints
- Special publications

INTERIOR: Geological Survey

- Books
- Maps
- Charts
- Atlases
- Research summaries
- Journal articles
- *Bibliography of North American Geology*
- *Geophysical Abstracts*

HEW: National Institutes of Health

- Journals of the institutes
- Journal articles
- Indexes
- Bibliographies
- Abstracts
- Monographs
- Books
- Reports

Alcohol, Drug Abuse, and Mental Health Administration

- Scientific and technical papers
- Manuals
- Reviews and analyses
- Journal articles

Office of Education

- *Research in Education*

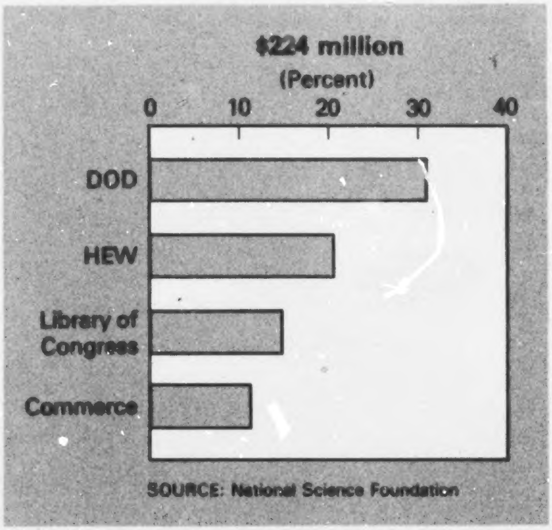
USDA

- Papers
- Bulletins
- Reports
- Periodicals

AEC

- Technical reports
- Progress reports
- Summary reports
- Topical reports
- Journal articles
- Proceedings of meetings
- *Nuclear Science Abstracts*
- Progress reviews
- Books
- Monographs
- Bibliographies

Category 2. Documentation, reference, and information services



SOURCE: National Science Foundation

DOD: Defense Agencies

- Defense Documentation Center

Departments of the Army, Navy, and Air Force

- Libraries
- Specialized information centers
- Technical information analysis centers
- Translations

HEW: National Institutes of Health

- National Library of Medicine
- Specialized information centers
- Translations

Office of Education

- ERIC system of information clearinghouses in education research

Food and Drug Administration

- Specialized information centers

Alcohol, Drug Abuse, and Mental Health Administration

- Specialized information centers

LIBRARY OF CONGRESS

- Science and technology portion

COMMERCE: Patent Office

- Search Room

National Bureau of Standards

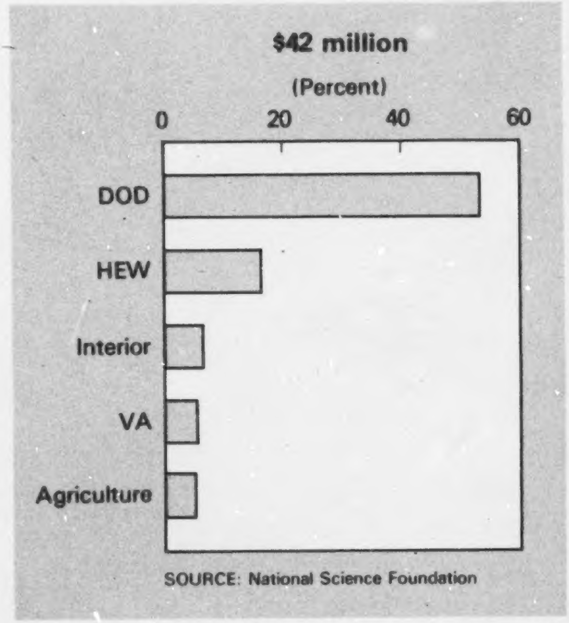
- National Technical Information Service (NTIS)
- National Standard Reference Data System (NSRDS)

NASA
- STI documentation facility
- Headquarters and field center libraries
- Specialized information centers
- Regional dissemination centers
- Translations

DOT
- Specialized information centers

USDA
- National Agricultural Library

Category 3. Symposia and audiovisual media



SOURCE: National Science Foundation

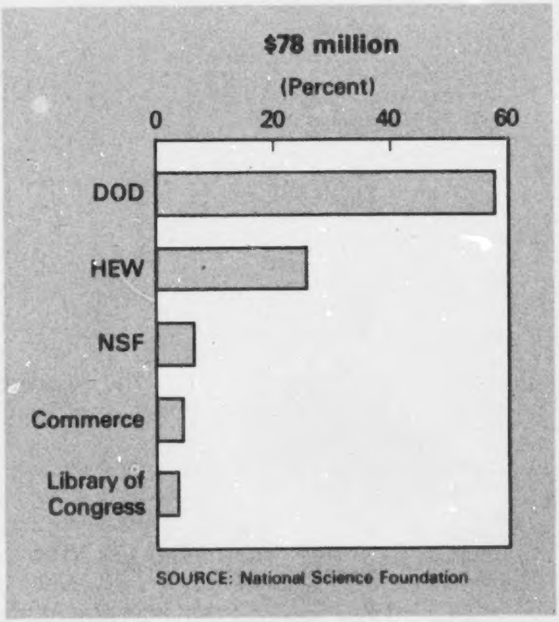
DOD: Departments of the Army, Navy, and Air Force
- Science conferences
- Support of symposia with professional groups, scientific societies, and educational institutions
- Motion pictures
- Slides
- Video tapes
- Exhibits

HEW: National Institutes of Health
- Travel to scientific meetings, U.S. and abroad
- Support of conferences and symposia
- Support of international congresses
- Sound films on body functions, diseases, and treatment
- TV interviews
- Slides
- Photographs
- Exhibits

NASA
- Participation in and support of scientific symposia and technical meetings

VA
- Participation in seminars and symposia
- Films
- Slides

Category 4. Research and development in information sciences, documentation, and information systems, techniques, and devices



SOURCE: National Science Foundation

HEW: National Institutes of Health

- Travel to scientific meetings, U.S. and abroad
- Support of conferences and symposia
- Support of international congresses
- Sound films on body functions, diseases, and treatment
- TV interviews
- Slides
- Photographs
- Exhibits

NASA

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VA

- Participation in seminars and symposia
- Films
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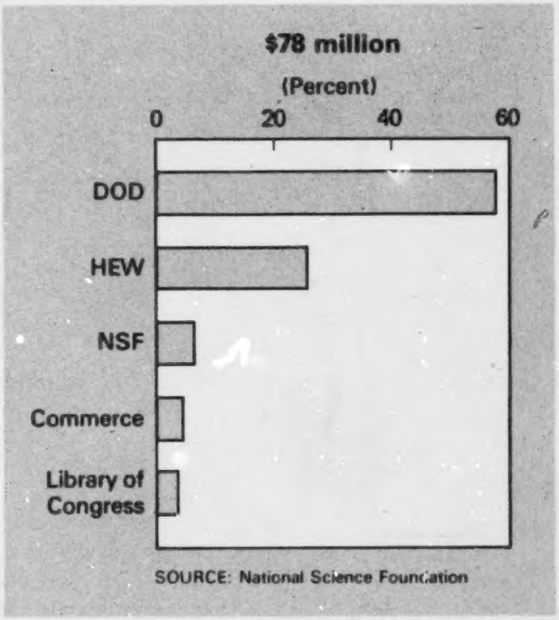
Category 4. Research and development in information sciences, documentation, and information systems, techniques, and devices



SOURCE: National Science Foundation

DOD: Defense Agencies (largely ARPA)
Departments of the Army, Navy, and Air Force

- R&D in advanced information systems
- Development of engineering data systems
- Support of development of discipline-based information systems
- Studies of man-computer relationships (Project MAC)
- Basic research in information sciences

HEW: National Institutes of Health (including NLM)

- Improvement of MEDLARS system at NLM
- Development of mechanized searching services in the institutes
- Development of computer time-sharing techniques

Alcohol, Drug Abuse, and Mental Health Administration

- Improvement of information systems

Office of Education

- Bibliographic automation of large library operations
- Development of an automated instructional materials-handling program

NSF

- Support of information systems development
- Research in communication process and retrieval strategies

APPENDIXES

A. Technical Notes

B. Federally Funded Research and Development Centers

C. Statistical Tables, Part I

Note

The detailed statistical tables for this volume for parts I and II, appendixes C and D, have been published separately under one cover.

Included on pp. 58-66 in this volume are appendix C summary tables 1, 2, and 3, as well as a complete listing of all the tables in appendixes C and D. **Detailed statistical tables may be obtained gratis from the National Science Foundation, Washington, D. C. 20550.**

APPENDIX A

Technical Notes

SCOPE AND METHOD

This report is organized in two parts. Part I is concerned with Federal funds for research, development, and R&D plant, and part II reports on funds for activities associated with the collection and dissemination of scientific and technical information.

Between March and May of 1974, 34 Federal agencies and their subdivisions — a total of 93 individual respondents — submitted data in response to a survey questionnaire developed by the Foundation and distributed in January 1974. With the exception of AEC and NASA, the data received from the agencies were in terms of obligations and expenditures incurred, or expected to be incurred, regardless of when the funds were appropriated or whether they were identified in the respondent's budget specifically for R&D activities. The AEC data for research and development were reported in terms of accrued costs, while the R&D plant transactions were reported in terms of obligations. NASA reported its 1973 transactions in terms of obligations incurred, whereas the 1974 and 1975 transactions were in terms of the budget plan, which approximates obligations.

Federal agencies also provided R&D data to the Office of Management and Budget for inclusion in "Special Analysis O (Revised), Federal Research and Development Programs" in *The Budget of the United States Government, Fiscal Year 1975*. Although the R&D data in the two reports are reconcilable (see Relation to Other Reports, pg. 55), the data in the *Federal Funds* report are more comprehensive and are tabulated in greater detail. Furthermore, the *Federal Funds* report incorporates data revisions that have resulted from changes made within the R&D portion of the budget subsequent to its presentation by the President to Congress in February 1974.

DEFINITIONS

Definitions are presented for the two parts of the report. Some definitions in part I are also applicable to part II. The definitions are essentially unchanged from prior issues of the *Federal Funds* series.

Part I. Research, Development, and R&D Plant

(1) RESEARCH, DEVELOPMENT, AND R&D PLANT

This term includes all direct, indirect, incidental, or related costs resulting from or necessary to research, development, and R&D plant, regardless of whether the research and development are performed by a Federal agency (intramural) or performed by private individuals and organizations under grant or contract (extramural). Research and development exclude routine product testing,

DIX A

Notes

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DEFINITIONS

Definitions are presented for the two parts of the report. Some definitions in part I are also applicable to part II. The definitions are essentially unchanged from prior issues of the *Federal Funds* series.

Part I. Research, Development, and R&D Plant

(1) RESEARCH, DEVELOPMENT, AND R&D PLANT

This term includes all direct, indirect, incidental, or related costs resulting from or necessary to research, development, and R&D plant, regardless of whether the research and development are performed by a Federal agency (intramural) or performed by private individuals and organizations under grant or contract (extramural). Research and development exclude routine product testing, quality control, mapping and surveys, collection of general purpose statistics, experimental production, and activities concerned primarily with the dissemination of scientific information and the training of scientific manpower.

a. **Research** is systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied.

In **basic research** the investigator is concerned primarily with gaining a fuller knowledge or understanding of the subject under study.

In **applied research** the investigator is primarily interested in a practical use of the knowledge or understanding for purpose of meeting a recognized need.

b. **Development** is systematic use of the knowledge and understanding gained from research, directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. It excludes quality control, routine product testing, and production.

c. **R&D plant** (R&D facilities and fixed equipment, such as reactors, wind tunnels, and radio telescopes) includes acquisition of, construction of, major repairs to, or alterations in structure, works, equipment, facilities, or land, for use in R&D activities at Federal or non-Federal installations. Excluded from the R&D plant category are expendable equipment and office furniture and equipment. Obligations for foreign R&D plant are limited to Federal funds for facilities located abroad and used in support of foreign research and development.

(2) OBLIGATIONS AND EXPENDITURES

a. **Obligations** represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when the funds were appropriated and when future payment of money is required.

b. **Expenditures** represent the amounts for checks issued and cash payments made during a given period, regardless of when the funds were appropriated.

For those agencies operating on a cost-type budget, accrued expenditures and costs are reported instead of obligations. Accrued expenditures represent all costs accrued during the reporting period except those subject to reimbursement from other agencies. The information on expenditures represents net cash payments for research, development, and R&D plant, exclusive of any receipts of the agency for those purposes.

The obligations and expenditures reported cover all transactions from all funds available to the agency from direct appropriations, trust funds or special account receipts, corporate income, or other sources, including funds appropriated by the President, that the agency received or expects to receive. The amounts reported for each year reflect obligations and expenditures for that year regardless of when the funds were originally authorized or received and regardless of whether they were appropriated, received, or identified in the agency's budget specifically for research, development, or R&D plant.

An agency making a transfer of funds to another agency includes such transfers in its report of obligations and expenditures. The receiving agency does not report, for purposes of this survey, funds transferred to it from another agency. Similarly, a subdivision of an agency reports such obligations or expenditures.

Obligations and expenditures for work performed in foreign countries include funds directly available to Federal agencies and special foreign currencies separately appropriated. (The latter currencies are derived largely from provisions of Public Law 480, 1954, as amended.)

(3) COST COVERAGE

Funds reported for research and development reflect full costs. In addition to costs of specific R&D projects, the applicable overhead costs are also included. The amounts reported include the costs of planning and administering R&D programs, laboratory overhead, pay of military personnel, and departmental administration.

(4) FISCAL YEAR

The fiscal year is the Government accounting period beginning July 1 of one year and ending June 30 of the following calendar year; thus, fiscal year 1975 began on July 1, 1974 and will end June 30, 1975.

(5) AGENCY

An agency is an organization of the Federal Government whose principal executive officer reports to the President. The only exception is the Library of Congress, which is also included in the survey. The term subdivision refers to any major organizational unit of a reporting agency, such as a bureau, division, office, or service.

(6) PERFORMERS

Performers are either intramural organizations accomplishing operating functions or extramural organizations or persons receiving support or providing services as a result of a contract or grant.

a. **Intramural performers** are the agencies of the Federal Government. Their work is carried on directly by their own personnel. Obligations reported under this category are for activities performed by the reporting agency itself, or they represent funds that the agency transfer to another Federal agency for performance for work. The ultimate performer must be a Federal agency. If the ultimate performer is not a Federal agency, the funds so transferred are reported by the transferring agency under the appropriate extramural performer category (industrial firms, universities and colleges, other nonprofit institutions). Intramural performance includes the costs of supplies and equipment, essentially of an "off-the-shelf" nature, that are procured for use in intramural research and development. Also included as part of the intramural performance total are the expenses of Federal personnel engaged in planning and administering intramural and extramural R&D programs.

b. **Extramural performers** are all organizations outside the Federal complex that perform with Federal funds under contract or grant. Only costs of actual extramural R&D performance are reported. For example, the purchase from an extramural source of a launch vehicle which is operational, i.e., has gone beyond the development or prototype stage and which is used in an intramural Federal installation for the performance of research and development, is reported as part of the cost of intramural research and development. Extramural performers are identified as follows:

(i) *Industrial firms* are those organizations that may legally distribute net earnings to individuals or to other organizations.

(ii) *Universities and colleges* are institutions engaged primarily in providing resident instruction for at least a 2-year program above the secondary school level. Included are colleges of liberal arts; schools of arts and sciences; professional schools, such as in engineering and medicine, including affiliated hospitals; associated research institutes; and agricultural experiment stations.

(iii) *Other nonprofit institutions* are private organizations other than educational institutions, no part of whose net earnings inure to the benefit of a private stockholder or individual, and other private organizations organized for the exclusive purpose of turning over their entire net earnings to such nonprofit organizations. Also, private individuals directly awarded R&D grants or contracts are included under nonprofit institutions.

(iv) *Federally Funded Research and Development Centers* are R&D-performing organizations exclusively or substantially financed by the Federal Government that are supported by the Federal Government either to meet a particular R&D objective or, in some instances, to provide

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In general, all of the following qualification criteria are met by an institutional unit before it is included in the Federally Funded Research and Development Center category: (1) Its primary activities include one or more of the following: basic research, applied research, development, or management of research and development (specifically excluded are organizations engaged primarily in routine quality control and testing, routine service activities, production, mapping and surveys, and information dissemination); (2) it is a separate operational unit within the parent organization or is organized as a separately incorporated organization; (3) it performs actual research and development or R&D management either upon direct request of the Federal Government or under a broad charter from the Federal Government, but in either case under the direct monitorship of the Federal Government; (4) it receives its major financial support (70 percent or more) from the Federal Government, usually from one agency; (5) it has or is expected to have a long-term relationship with its sponsoring agency (about 5 years or more), as evidence by specific obligations assumed by it and the agency; (6) most or all of its facilities are owned or are funded for in the contract with the Federal Government; and (7) it has an average annual budget (operating and capital equipment) of at least $500,000.

(v) *State and local governments* are State and local government agencies, excluding State and local universities and colleges, agricultural experiment stations, medical schools, and affiliated hospitals. Federal R&D funds obligated directly to such State and local education institutions are included under the universities and colleges performing sector in this survey. Research and development under the State and local category are either performed by the State or local agencies themselves or granted or contracted by such agencies for performance by other organizations. Regardless of the ultimate performer, Federal R&D funds directed to State and local governments are reported under the State and local government sector and no other.

(vi) *Foreign performers* are confined to foreign citizens, organizations, or governments, as well as international organizations, such as NATO, UNESCO, WHO, performing work abroad financed by the Federal Government. Excluded are payments to U.S. agencies, organizations, or citizens performing research and development abroad for the Federal Government. (The survey objectives do not include information on "offshore" payments.) Also excluded are payments to foreign scientists performing in the United States.

(7) FIELDS OF SCIENCE

The fields of science in this survey are divided into eight broad field categories, most of them consisting of a number of detailed fields. The broad fields are life sciences, psychology, physical sciences, environmental sciences, mathematics, engineering, social sciences, and other sciences not elsewhere classified. The following listing presents the fields grouped under each of the broad fields, together with illustrative disciplines.

a. **Life sciences** consist of the biological, clinical medical, other medical sciences, and life sciences not elsewhere classified.

Life sciences include the following disciplines: Anatomy; animal sciences; bacteriology; biochemistry; biogeography; biological oceanography; biophysics; dentistry; ecology; embryology; entomology; evolutionary biology; genetics; immunology; internal medicine; microbiology; neurology; nutrition and metabolism; opthalmology; parasitology; pathology; pharmacology; pharmacy; physical anthropology; physical medicine and rehabilitation; physiology; plant sciences; podiatry; preventive medicine and public health; psychiatry; radiobiology; radiology; surgery; systematics; veterinary medicine.

Research in some of these disciplines may be classed as biological, clinical medical, or other medical, depending upon the nature of the particular project.

Biological sciences are those which, apart from the clinical medical and other medical sciences as defined below, deal with the origin, development, structure, function, and interactions of living things.

Clinical medical sciences are concerned with the study of the pathogenesis, diagnosis, or therapy of a particular disease or abnormal condition in living human subjects under controlled conditions.

Other medical sciences are concerned with studies of the causes, effects, prevention, or control of abnormal conditions in man or in his environment as they relate to health, except for the clinical aspects as defined above.

Life sciences, nec[1]

b. **Psychology** deals with behavior, mental processes, and individual and group characteristics and abilities. Psychology is divided into three categories: biological aspects, social aspects, and psychological sciences not elsewhere classified. Examples of the disciplines under each of these fields are:

Biological aspects:

experimental psychology; animal behavior; clinical psychology; comparative psychology; ethology.

Social aspects:

social psychology; educational, personnel, vocational psychology and testing; industrial and engineering psychology; development and personality.

Psychological sciences, nec[1]

c. **Physical sciences** are concerned with the understanding of the material universe and its phenomena. They comprise the fields of astronomy, chemistry, physics, and physical sciences not elsewhere classified. Examples of the disciplines under each of these fields are:

Astronomy:

laboratory astrophysics; optical astronomy; radio astronomy; theoretical astrophysics; X-ray, Gamma-ray, neutrino astronomy.

Chemistry:

inorganic; organo-metallic; organic; physical.

Physics:

acoustics; atomic and molecular; condensed matter; elementary particles; nuclear structure; optics; plasma.

Physical sciences, nec[1]

d. **Environmental sciences** (terrestrial and extraterrestrial) are concerned with the gross nonbiological properties of the areas of the solar system which directly or indirectly affect man's survival and welfare; they comprise the fields of atmospheric sciences, geological sciences, oceanography, and environmental sciences not elsewhere classified. Obligations for oceanography are confined to studies supporting physical oceanography. Studies pertaining to life in the sea, or other bodies of water, are reported as support biology. Support of ship operations is, where appropriate, prorated between physical and biological oceanography. Examples of the disciplines under each of these fields follow.

Atmospheric sciences:

aeronomy; solar; weather modification; extraterrestrial atmospheres; meteorology.

Geological sciences:

engineering geophysics; general geology; geodesy and gravity; geomagnetism; hydrology; inorganic geochemistry; isotopic geochemistry; organic geochemistry; laboratory geophysics; paleomagnetism; paleontology; physical geography and cartography; seismology; soil sciences.

Oceanography:

chemical oceanography; geological oceanography; physical oceanography; marine geophysics.

Environmental sciences, nec[1]

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[1] Not elsewhere classified. Includes multidisciplinary projects within the broad field and single-disciplinary projects for which a separate field has not been assigned.

Social aspects:

social psychology; educational, personnel, vocational psychology and testing; industrial and engineering psychology; development and personality.

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laboratory astrophysics; optical astronomy; radio astronomy; theoretical astrophysics; X-ray, Gamma-ray, neutrino astronomy.

Chemistry:

inorganic; organo-metallic; organic; physical.

Physics:

acoustics; atomic and molecular; condensed matter; elementary particles; nuclear structure; optics; plasma.

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Oceanography:

chemical oceanography; geological oceanography; physical oceanography; marine geophysics.

Environmental sciences, nec[1]

e. **Mathematics** employs logical reasoning with the aid of symbols and is concerned with the development of methods of operation employing such symbols. Examples of mathematical disciplines are algebra; analysis; applied mathematics; computer science; foundations and logic; geometry; numerical analysis; statistics; topology.

f. **Engineering** is concerned with studies directed toward developing engineering principles or toward making specific scientific principles usable in engineering practice. Engineering is divided into eight fields: aeronautical, astronautical, chemical, civil, electrical, mechanical, metallurgy and materials, and engineering not elsewhere classified. The following are examples of disciplines under each of these fields.

Aeronautical:

aerodynamics.

Astronautical:

aerospace; space technology.

Chemical:

petroleum; petroleum refining; process.

Civil:

architectural; hydraulic; hydrologic; marine; sanitary and environmental; structural; transportation.

Electrical:

communication; electronic power.

Mechanical:

engineering mechanics.

Metallurgy and materials:

ceramic; mining; textile; welding.

Engineering, nec[1]

agricultural; industrial and management; nuclear; ocean engineering; systems.

g. **Social sciences** are directed toward an understanding of the behavior of social institutions and groups and of individuals as members of a group. These sciences include anthropology, economics, history, linguistics, political science, sociology, and social sciences not elsewhere classified. The following are examples of the disciplines under the fields of social sciences.

Anthropology:

archaeology; cultural and personality; social and ethnology; applied anthropology.

Economics:

econometrics and economic statistics; history of economic thought; international economics; industrial, labor, and agricultural economics; macroeconomics; microeconomics; public finance and fiscal policy; theory; economic systems and development.

History:

cultural; political; social; history and philosophy of science.

Linguistics:

anthropological-archaeological; computational; psycholinguistics; sociolinguistics.

Political science:

area or regional studies; comparative government; history of political ideas; international relations and law; national political and legal systems; political theory; public administration.

Sociology:

comparative and historical; complex organizations; culture and social structure; demography; group interactions, social problems and social welfare; sociological theory.

Social sciences, nec[1]

research in law and education not elsewhere classified; socioeconomic geography.

h. **Other sciences not elsewhere classified** includes multidisciplinary and interdisciplinary projects that cannot be classified within one of the above broad fields of science.

(8) GEOGRAPHIC DISTRIBUTION OF 1973 R&D OBLIGATIONS

a. Eleven agencies participated in the survey on the geographic distribution of obligations for research and development and R&D plant. These 11 respondents accounted for 98 percent of total Federal R&D and R&D plant obligations in 1973. The respondents were the Departments of Agriculture, Commerce, Defense, the Interior, Transportation, and Health, Education, and Welfare; the Atomic Energy Commission; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Science Foundation; and the Office of Economic Opportunity.

b. Data for 1973 were requested in terms of the principal location (State or outlaying area) where the work was performed by the prime contractor, grantee, or intramural organization. Where this information was not available in their records, the respondents were asked to assign the obligations to the State, outlying area, etc. where the prime contractor, grantee, or intramural organization was located.

c. Obligations were reported for research and development as a combined amount.

d. Specifically omitted from the survey were R&D obligations to foreign performers and obligations for R&D plant used in support of foreign performers.

e. In addition to obtaining data on a prime contractor or grantee basis, the survey requested information on the geographic distribution of 1973 first-tier subcontracting under each new and continuing prime contract or grant for which $20 million or more was obligated in 1973.

Part II. Scientific and Technical Information

Scientific and technical information consists of knowledge or data resulting from the conduct of research and development, or knowledge or data required for organizing, administering, or performing research and development. It encompasses any information in recorded or other communicable form which presents the status, progress, or results of research and development in science or technology.

Exclusions:

(a) training costs for personnel engaged in scientific and technical information activities;

(b) raw scientific and technical data that have not been processed for use by scientific personnel engaged in research and development (covered in part I of this survey);

(c) statistical and general-purpose data that are collected and organized for other than specific use in research and development;

(d) information that has been prepared primarily to inform or instruct the general public or others below the graduate or professional level of scientific activity.

Scientific and technical information activities include all management, administrative, R&D, and operational efforts directed to the planning, support, control, and improvement of the functions or tasks that deal with the acquisition, processing, handling, and communication of scientific and technical information. These may include the acquisition, maintenance, or rental of special equipment primarily for use in connection with scientific and technical information activities.

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Categories of Scientific and Technical Information Activity

(1) PUBLICATION AND DISTRIBUTION

(a) **Publication and distribution.** This subcategory includes two activities.

Publication includes all document production tasks performed after the author's manuscript or similar initial recording of the information has been finished and leading to but not including initial issuance or distribution of the finished document. Examples of publication activities: evaluation of a manuscript or patent; professional writing; technical or copy editing and revising not performed by the author, abstractor, or bibliographer; technical drawing and artwork; preparation of final copy for printing or other reproduction; also composing, typesetting, proofreading, display, illustrating, photographing, layout, makeup, printing, mimeographing and photoduplication.

These publication activities may be concerned with any of the following: data compilations, proceedings of conferences and symposia, specifications and manuals used in the R&D process, technical reports, journal articles, monographs, reviews, dissertations, summaries, abstracts, bibliographies, indexes, special reports, patents, reference books, and treatises.

Distribution includes functions related to the initial transmission or dissemination of newly documented scientific and technical information from source to user; for example, mailing, shipping, and maintenance of controls.

Excluded from category 1 are professional efforts involved in the compilation and preparation of reference documents or bibliographies. These activities are included under category 2, below. Also excluded are audiovisual aids, such as taped talks, slide presentations, and motion picture films. These are included under category 3, below.

b. **Support of publications** includes all page charges paid out of Federal funds to primary journals; special subscription arrangements to maintain primary journals; and grants or contracts for publication and distribution of journals, conference proceedings, monographs, or textbooks.

(2) DOCUMENTATION, REFERENCE AND INFORMATION SERVICES

a. **Library and reference services** includes the acquisition, collection, exchange, loan, and storage of scientific and technical documentary materials. These may be books, periodicals, manuals, reports, and drawings, and such reference sources as abstract journals, indexes, and subject heading and title lists. This subcategory includes such activities as the organizing and processing of scientific and technical documentary materials. Such work may consist of indexing, coding, filing, subject classifying, abstracting, announcing, listing, preparing bibliographies, reviewing, screening, documenting, and cataloging.

This category includes rental or acquisition and maintenance of computers and other equipment and costs of their operation. It includes special retrieval services provided in response to user needs (reprography, SDI, demand bibliographies, etc.), sale and loan of documentary materials, dissemination of documents via mail and personal visits, and liaison activities with users and other information services.

Documentation centers, depositories, clearinghouses, and libraries are included under this subcategory (a).

b. **Specialized information center services** (including technical information analysis center services) cover the collection, review, summarization, and evaluation of scientific and technical information and data in well-defined, specialized fields. They include advisory and other user services. Specialized information centers may be either discipline- or mission-oriented. The services of these centers are distinguished from those of documentation centers, clearinghouses, and libraries, whose functions are primarily concerned with the handling of documents rather than with the technical information contained in the documents.

c. **Translations** include all costs involved in the translation of documents and other materials from one language to another in support of R&D activities; also the purchase of foreign journals and other materials to be translated.

(3) SYMPOSIA AND AUDIOVISUAL MEDIA

a. **Symposia and technical meetings** include all efforts directed to planning, scheduling, announcing, supporting, sponsoring, conducting, and attending symposia, conferences, and meetings primarily concerned with disseminating scientific and technical information. The travel and subsistence of participants in such symposia, conferences, and meetings are covered in these costs.

b. **Audiovisual media and other forms of nonprinted communication** refer to the costs of producing technical and documentary motion picture films, slides, and photographs for R&D purposes, as well as audio and visual aids, such as taped talks, television film or visual magnetic tape. This category also includes exhibits but excludes media primarily intended for training or public information purposes.

(4) RESEARCH AND DEVELOPMENT IN INFORMATION SCIENCES, DOCUMENTATION AND INFORMATION SYSTEMS, TECHNIQUES AND DEVICES

This category includes the conduct and support of research and development of new and nonconventional methods, techniques, systems, and machines for improving scientific and technical information functions under each of the other three categories. Such support would include meetings related specifically to such R&D work.

It also includes the conduct and support of studies and surveys to identify broad and specific aspects of scientific information problems. Examples of activities included under this category are development and testing of machines, devices, and techniques for storage and retrieval of information and data; linguistics research focused on information processing; language and machine translation; information theory; automata theory; artificial intelligence; logic and switching theory; operations or systems research on scientific and technical information systems and processes; documentation or document storage and retrieval; library science; network design; studies of subject classification and indexing schemes; and studies of scientific and technical information communication systems.

Also included under this category are applicable R&D costs for improving, modernizing, and renovating current scientific and technical information, data, and communication systems. Research and development conducted at documentation centers, libraries, and specialized information centers are included but not the costs associated with establishing new centers or systems once past the development state. As soon as a new system moves out of the experimental phase and into the operational phase, its costs are included under the appropriate category and subcategory above (1, 2, or 3) and no longer under category 4.

CHANGES IN REPORTING

Responses from the agencies in this survey, as in the previous ones, reflect updating of estimates for the latest 2 years of the previous report. Such updating is normal in the budgetary cycle. In addition, from time to time responses have reflected reappraisals and revisions in classification of various phases of agencies' R&D programs. When this has occurred, the National Science Foundation has revised prior-year data to maintain consistency and comparability with the most recent reporting. Since no statistical inquiry is free of problems of concepts and definitions for the respondents, revisions to improve the reporting are encouraged by NSF. No significant revisions in reporting, however, were made for the agencies in this present survey.

LIMITATIONS OF THE DATA

Funds for research, development, and other scientific activities are reported on a three-year basis comparable with the 1975 budget, upon which the data are based. The respondents have reconciled the data reported here with amounts for scientific activities shown in *The Budget of the* methods, techniques, systems, and machines for improving scientific and technical information functions under each of the other three categories. Such support would include meetings related specifically to such R&D work.

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Data submitted by the Federal agencies for 1973 are considered to be actual since they represent essentially completed transactions. Amounts reported for 1974 and 1975 are estimates in that they are subject to further appropriation, apportionment, or allocation decisions. The actual effects of those and other later actions on 1974 and 1975 expenditures and obligations will be reflected in next year's report.

It is important to bear in mind that subjective determinations are often necessary in classifying the data. Because of the scope of R&D programs and their multidisciplinary nature, it is difficult to establish consistent criteria for allocating efforts among the character-of-work categories and the various fields of science. Also, funds for R&D activities may not be specifically identified in an agency's budget. However, to meet survey requirements, the participating agencies over the years have developed increasingly consistent bases for classifying R&D data. Any data revisions resulting from changes in an agency's reporting practices have been incorporated into the historical data to improve the comparability and consistency of the statistical series.

In some cases it has not been possible to report the full cost of research and development. For example, the headquarters costs of planning and administering R&D programs of DOD and AEC are not included in these reports because these agencies have indicated that it is administratively impracticable to identify the amounts.

R&D plant data reported here are to some extent understated because of the difficulty encountered by some agencies in identifying and reporting this information, particularly in the case of DOD and NASA. While DOD reports obligations for R&D plant funded by its construction appropriation, DOD is able to identify only a small portion of the amount of R&D plant support included in R&D contracts that were funded from its RDT&E appropriation. NASA faces similar problems in reporting R&D plant data.

In the area of scientific and technical information, extramural obligations are limited to funds allocated for grants and contracts that are primarily for the support of scientific and technical information activities. As in prior volumes of this series, extramural funds for information activities performed as supplemental, supporting service under grants or contracts primarily for research and development have been excluded because it is not feasible for the respondent to determine what portion of an R&D grant or contract actually supports information activities. Some R&D projects receive support from several agencies through a number of grants and/or contracts, and in such instances, related information activities pertaining to the overall R&D project may not be identifiable under a specific grant or contract.

RELATION TO OTHER REPORTS

(1) FEDERAL SUPPORT TO UNIVERSITIES AND COLLEGES

The National Science Foundation prepares reports covering Federal support of individual colleges and universities. These reports are based on data provided by the Federal agencies in response to the reporting system established by the Committee on Academic Science and Engineering (CASE) of the Federal Council for Science and Technology. (These reports are referred to in this publication as the CASE reports.)

Both the CASE and *Federal Funds* reports provide data on Federal obligations for research and development and R&D plant to universities and colleges and to university-administered Federally Funded Research and Development Centers (FFRDC's). The CASE report, however, is based on obligations of Federal agencies to each individual academic institution, while the Federal Funds report is concerned with obligations to universities and colleges as a performer group. Further, the CASE study is based on reports of only 14 agencies (the Department of Agriculture; Commerce; Defense; Health, Education, and Welfare; Housing and Urban Development; the Interior; Labor; and Transportation; the Atomic Energy Commission; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Science Foundation; the Agency for International Development; and the Office of Economic Opportunity) while Federal Funds is composed of obligations of all agencies. (The 14 respondents for CASE account for more than 99 percent of the Federal R&D total to universities and colleges and virtually all obligations to university-administered FFRDC's.) In addition, the CASE report includes funds for other activities, such as science education and nonscience support.

The different reporting procedures have led to different amounts being reported by CASE and *Federal Funds* as follows:

a. The obligations for research and development to universities and colleges reported for Federal Funds in 1973 amounted to $1,916 million, or $45 million more than the amount reported for CASE. Part of this difference can be attributed to variations in the amounts reported by HEW's National Institutes of Health. The *Federal Funds* R&D total for the National Institutes of Health included funds for General Research Support grants, whereas in CASE they were placed under the category of "general support for science," which is defined to cover such grants. A difference in reported totals for NSF programs was another factor contributing to the overall higher *Federal Funds* total. For *Federal Funds* NSF reported that portion of science development program funds which supported R&D activities, while for CASE all such funds were reported under the "general support for science" category.

b. The R&D obligation total to university-administered FFRDC's reported for *Federal Funds* was $725 billion in 1973, or $184 million less than reported for CASE. The $122 million subcontracted by NASA's Jet Propulsion Laboratory accounted for two-thirds of this difference. For *Federal Funds* this amount is included in ultimate-performer categories (mainly industry), while for CASE the subcontracted amount was included in the R&D obligations to FFRDC's administered by universities.

c. The total R&D plant obligations to universities and colleges reported for both *Federal Funds* and CASE were $43 million in 1973.

d. The total R&D plant obligations to FFRDC's administered by universities and colleges reported for *Federal Funds* was $162 million in 1973, or $67 million more than reported for CASE. Most of this difference arose from AEC reporting "costs" for CASE and "obligations" for *Federal Funds*.

The following factors should also be considered in comparing the data appearing in the two reports:

For *Federal Funds* each agency includes in its own obligations the amounts transferred to other agencies for furtherance of its work, and the receiving agencies do not report funds transferred to them. On the other hand, in the CASE survey, the data are reported by the agency that made the final distribution of the funds to a given institution. Thus, for the CASE survey, agencies included funds received from other agencies, and excluded funds transferred to other agencies, the reverse of the *Federal Funds* process. While such transfers should balance each other out with no resulting changes in total R&D obligations, these varying reporting practices do add to the possibility of differences between the two reports.

The CASE reports, in most instances, are prepared by different operational units within each agency than those that prepare the *Federal Funds* responses. Furthermore, the CASE data are collected several months earlier than the *Federal Funds* statistics. Although, in theory, these conditions in themselves should not lead to reporting differences, in practice differences do arise.

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(2) SPECIAL ANALYSES, BUDGET OF THE UNITED STATES

In a section of *Special Analyses, Budget of the United States Government*, the Office of Management and Budget (OMB) publishes estimates of obligations and expenditures for research, development, and R&D plant. However, the data in "Special Analysis O (Revised), Federal Research and Development Programs" in the 1975 budget do not provide as much detail on character of work or performers as *Federal Funds* and no information on fields of science or geographic distribution.

However, "Special Analysis O (Revised)" and *Federal Funds* uitilize the same definition for research and development and for R&D plant. The estimates for research and development published in the two reports are comparable, even though minor differences do exist. The differences between the two reports are as follows:

Total R&D obligations
[Billions of dollars]

	FY 1973	*FY 1974*	*FY 1975*
Federal Funds	$16.8	$17.7	$19.6
Special Analysis O (Revised)	16.8	17.9	19.6

(3) AN ANALYSIS OF FEDERAL R&D FUNDING BY FUNCTION, FY 1969-75

NSF has published a report under the above title, providing an analysis of Federal R&D obligations by functional categories. The annual *Federal Funds* series, by contrast, reports on Federal R&D obligations by agencies but not by functional categories. The R&D obligations data for 1969-75 in the function report were based on information submitted by the agencies for the *Federal Funds* series. Thus, the overall R&D obligations are the same for the same years covered in both reports.

(4) OTHER REPORTS

a. Individual agencies may classify their R&D programs for purposes other than those for which the *Federal Funds* survey is conducted. Definitions and guidelines that are suitable to those other purposes may result in information that is not comparable with the data transmitted to the Foundation for *Federal Funds*.

b. *The Budget of the United States Government, Fiscal Year 1975* is the source of data on outlays for specific items, but the NSF definition of "relatively uncontrollable" outlays differs from that of OMB in that OMB designates outlays from prior-year contracts and obligations as relatively uncontrollable whereas NSF considers this category of outlays to be initially controllable and therefore different in concept from open-ended programs like social security, veterans compensation and pensions, and interest on the national debt. See the *1975 Budget*, p. 318.

SOURCES

Data on R&D funds in this report for years prior to 1952 were compiled by the Bureau of the Budget (which later became the Office of Management and Budget). Subsequent data were based on NSF surveys. These data have been published in previous issues of this series, but certain adjustments have been made to reflect comparability with the latest reporting concepts evolved by the agencies.

Supplementing the statistical data collected through the Foundation's survey of Federal agencies, a variety of sources were used for the text of this report, including the narrative statements submitted by the agencies, published records of testimony presented by the agencies to committees of the Senate and the House, the *1975 Budget Appendix*, and personal contacts with agency respondents.

APPENDIX B

Federally Funded Research and Development Centers, Fiscal Years 1973-75

Department of Defense

OFFICE OF THE SECRETARY OF DEFENSE

Administered by other nonprofit institutions:

Institute for Defense Analyses (IDA)

DEPARTMENT OF THE ARMY

Administered by other nonprofit institutions;

Research Analysis Corporation (RAC)[1]

DEPARTMENT OF THE NAVY

Administered by universities and colleges:

Applied Physics Laboratory (Johns Hopkins University)
Applied Physics Laboratory (University of Washington)
Center for Naval Analyses (University of Rochester)
Applied Research Laboratory (Pennsylvania State University)[2]

DEPARTMENT OF THE AIR FORCE

Administered by universities and colleges:

Lincoln Laboratory (Massachusetts Institute of Technology)

Administered by other nonprofit institutions:

Aerospace Corporation
Analytic Services, Inc. (ANSER)
MITRE Corporation
RAND Corporation

Atomic Energy Commission

Administered by industrial firms:

Bettis Atomic Power Laboratory (Westinghouse Electric Corp.)
Hanford Engineering Development Laboratory (Westinghouse - Hanford Corp.)
Knolls Atomic Power Laboratory (General Electric Company)
Liquid Metal Engineering Center (Rockwell International Corporation)
Mound Laboratory (Monsanto Research Corp.)
National Reactor Testing Station (Aerojet Nuclear Corp.)
Oak Ridge National Laboratory (Union Carbide Corp.)
Sandia Laboratory (Western Electric Co., Inc. - Sandia Corp.)
Savannah River Laboratory (E.I. du Pont de Nemours & Co., Inc.)

Administered by universities and colleges:

Ames Laboratory (Iowa State University of Science and Technology)
Argonne National Laboratory (University of Chicago and Argonne Universities Assn.)
Brookhaven National Laboratory (Associated Universities, Inc.)
Cambridge Electron Accelerator (Harvard University)
E.O. Lawrence Berkeley Laboratory (University of California)

DEPARTMENT OF THE AIR FORCE

Administered by universities and colleges:

Lincoln Laboratory (Massachusetts Institute of Technology)

Administered by other nonprofit institutions:

Aerospace Corporation
Analytic Services, Inc. (ANSER)
MITRE Corporation
RAND Corporation

Atomic Energy Commission

Administered by industrial firms:

Bettis Atomic Power Laboratory (Westinghouse Electric Corp.)
Hanford Engineering Development Laboratory (Westinghouse - Hanford Corp.)
Knolls Atomic Power Laboratory (General Electric Company)
Liquid Metal Engineering Center (Rockwell International Corporation)
Mound Laboratory (Monsanto Research Corp.)
National Reactor Testing Station (Aerojet Nuclear Corp.)
Oak Ridge National Laboratory (Union Carbide Corp.)
Sandia Laboratory (Western Electric Co., Inc. - Sandia Corp.)
Savannah River Laboratory (E.I. du Pont de Nemours & Co., Inc.)

Administered by universities and colleges:

Ames Laboratory (Iowa State University of Science and Technology)
Argonne National Laboratory (University of Chicago and Argonne Universities Assn.)
Brookhaven National Laboratory (Associated Universities, Inc.)
Cambridge Electron Accelerator (Harvard University)
E.O. Lawrence Berkeley Laboratory (University of California)
E.O. Lawrence Livermore Laboratory (University of California)
Los Alamos Scientific Laboratory (University of California)
National Accelerator Laboratory (Universities Research Association, Inc.)
Oak Ridge Associated Universities
Plasma Physics Laboratory (Princeton University)
Stanford Linear Accelerator Center (Stanford University)

Administered by other nonprofit institutions:

Atomic Bomb Casualty Commission (National Academy of Sciences)
Pacific Northwest Laboratory (Battelle Memorial Institute)

National Aeronautics and Space Administration

Administered by universities and colleges:

Jet Propulsion Laboratory (California Institute of Technology)
Space Radiation Effects Laboratory (College of William and Mary)

National Science Foundation

Administered by universities and colleges:

Cerro Tololo Inter-American Observatory (Association of Universities for Research in Astronomy, Inc.)
Kitt Peak National Observatory (Association of Universities for Research in Astronomy, Inc.)
National Astronomy and Ionosphere Center (Cornell University)
National Center for Atmospheric Research (University Corporation for Atmospheric Research)
National Radio Astronomy Observatory (Associated Universities, Inc.)

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[1] Phased out as an FFRDC as of 1 September 1972. Obligations should be reported for FY 1973 only.

[2] Formerly Ordnance Research Laboratory (Pennsylvania State University).

APPENDIX C

A Listing of Statistical Tables Part I

Federal Funds for Research, Development, and R&D Plant

(Only summary tables 1, 2 & 3 appear in this volume.)

RESEARCH, DEVELOPMENT, AND R&D PLANT

C-1. Overall summary, fiscal years 1973, 1974, and 1975
C-2. By agency, fiscal years 1973, 1974, and 1975

RESEARCH AND DEVELOPMENT -- AGENCY, CHARACTER OF WORK, AND PERFORMER

C-3. By agency, fiscal years 1973, 1974, and 1974
C-4. By agency and character of work, fiscal year 1973
C-5. By agency and character of work, fiscal year 1974 (estimated) ....
C-6. By agency and character of work, fiscal year 1975 (estimated) ....
C-7. By agency and performer, fiscal year 1973 ....
C-8. By agency and performer, fiscal year 1974 (estimated) ....
C-9. By agency and performer, fiscal year 1975 (estimated) ....

TOTAL RESEARCH – AGENCY, PERFORMER, AND FIELD OF SCIENCE

C-10. By agency and performer, fiscal year 1973
C-11. By agency and performer, fiscal year 1974 (estimated) ....
C-12. By agency and performer, fiscal year 1975 (estimated) ....
C-13. By detailed field of science, fiscal years 1973, 1974, and 1975 ....
C-14. By agency and field of science, fiscal year 1973
C-15. By agency and field of science, fiscal year 1974 (estimated) ....
C-16. By agency and field of science, fiscal year 1975 (estimated) ....
C-17. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1973 ....
C-18. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1974 (estimated) ....
C-19. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1975 (estimated) ....
C-20. Life and environmental sciences, by agency and detailed field of science, fiscal year 1973 ....
C-21. Life and environmental sciences, by agency and detailed field of science, fiscal year 1974 (estimated) ....
C-22. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated) ....
C-23. Engineering, by agency and detailed field of science, fiscal year 1973 ....
C-24. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated) ....
C-25. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated) ....
C-26. Social sciences, by agency and detailed field of science, fiscal year 1973 ....
C-27. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated) ....
C-28. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated) ....

BASIC RESEARCH – AGENCY, PERFORMER, AND FIELD OF SCIENCE

C-29. By agency and performer, fiscal year 1973
C-30. By agency and performer, fiscal year 1974 (estimated) ....
C-31. By agency and performer, fiscal year 1975 (estimated) ....
C-32. By detailed field of science, fiscal years 1973, 1974, and 1975 ....
C-33. By agency and field of science, fiscal year 1973
C-34. By agency and field of science, fiscal year 1974 (estimated) ....
C-35. By agency and field of science, fiscal year 1975 (estimated) ....

TOTAL RESEARCH – AGENCY, PERFORMER, AND FIELD OF SCIENCE

C-10. By agency and performer, fiscal year 1973
C-11. By agency and performer, fiscal year 1974 (estimated)
C-12. By agency and performer, fiscal year 1975 (estimated)
C-13. By detailed field of science, fiscal years 1973, 1974, and 1975
C-14. By agency and field of science, fiscal year 1973
C-15. By agency and field of science, fiscal year 1974 (estimated)
C-16. By agency and field of science, fiscal year 1975 (estimated)
C-17. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1973
C-18. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-19. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-20. Life and environmental sciences, by agency and detailed field of science, fiscal year 1973
C-21. Life and environmental sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-22. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-23. Engineering, by agency and detailed field of science, fiscal year 1973
C-24. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated)
C-25. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated)
C-26. Social sciences, by agency and detailed field of science, fiscal year 1973
C-27. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-28. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated)

BASIC RESEARCH – AGENCY, PERFORMER, AND FIELD OF SCIENCE

C-29. By agency and performer, fiscal year 1973
C-30. By agency and performer, fiscal year 1974 (estimated)
C-31. By agency and performer, fiscal year 1975 (estimated)
C-32. By detailed field of science, fiscal years 1973, 1974, and 1975
C-33. By agency and field of science, fiscal year 1973
C-34. By agency and field of science, fiscal year 1974 (estimated)
C-35. By agency and field of science, fiscal year 1975 (estimated)
C-36. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1973
C-37. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-38. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-39. Life and environmental sciences, by agency and detailed field of science, fiscal year 1973
C-40. Life and environmental sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-41. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-42. Engineering, by agency and detailed field of science, fiscal year 1973
C-43. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated)
C-44. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated)
C-45. Social sciences, by agency and detailed field of science, fiscal year 1973
C-46. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-47. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated)

APPLIED RESEARCH – AGENCY, PERFORMER, AND FIELD OF SCIENCE

C-48. By agency and performer, fiscal year 1973
C-49. By agency and performer, fiscal year 1974 (estimated)
C-50. By agency and performer, fiscal year 1975 (estimated)
C-51. By detailed field of science, fiscal years 1973, 1974, and 1975
C-52. By agency and field of science, fiscal year 1973
C-53. By agency and field of science, fiscal year 1974 (estimated)
C-54. By agency and field of science, fiscal year 1975 (estimated)
C-55. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1973
C-56. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-57. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-58. Life and environmental sciences, by agency and detailed field of science, fiscal year 1973
C-59. Life and environmental sciences, by agency and detailed field of science, fiscal year 1974 (estimated)

C-60. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-61. Engineering, by agency and detailed field of science, fiscal year 1973
C-62. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated)
C-63. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated)
C-64. Social sciences, by agency and detailed field of science, fiscal year 1973
C-65. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-66. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated)

DEVELOPMENT — AGENCY AND PERFORMER

C-67. By agency and performer, fiscal year 1973
C-68. By agency and performer, fiscal year 1974 (estimated)
C-69. By agency and performer, fiscal year 1975 (estimated)

R&D PLANT

C-70. By agency, fiscal years 1973, 1974, and 1975
C-71. By agency and performer of the R&D the plant supports, fiscal year 1973
C-72. By agency and performer of the R&D the plant supports, fiscal year 1974 (estimated)
C-73. By agency and performer of the R&D the plant supports, fiscal year 1975 (estimated)

TOTAL RESEARCH PERFORMED AT UNIVERSITIES AND COLLEGES — AGENCY AND FIELD OF SCIENCE

C-74. By detailed field of science, fiscal years 1973, 1974, and 1975
C-75. By agency and field of science, fiscal year 1973
C-76. By agency and field of science, fiscal year 1974 (estimated)
C-77. By agency and field of science, fiscal year 1975 (estimated)
C-78. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1973
C-79. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-80. Psychology and physical sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-81. Life and environmental sciences, by agency and detailed field of science, fiscal year 1973
C-82. Life and environmental sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-83. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-84. Engineering, by agency and detailed field of science, fiscal year 1973
C-85. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated)
C-86. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated)
C-87. Social sciences, by agency and detailed field of science, fiscal year 1973
C-88. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-89. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated)

FOREIGN PERFORMERS — RESEARCH AND DEVELOPMENT

C-90. By region, country, and agency, fiscal year 1973
C-91. By region, country, and agency, fiscal year 1974 (estimated)

FOREIGN PERFORMERS — BASIC RESEARCH

C-92. By region, country, and agency, fiscal year 1973
C-93. By region, country, and agency, fiscal year 1974 (estimated)

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C-94. For research and development, by agency, fiscal years 1973, 1974, and 1975
C-95. For basic research, by agency, fiscal years 1973, 1974, and 1975
C-96. For applied research, by agency, fiscal years 1973, 1974, and 1975
C-97. For development, by agency, fiscal years 1973, 1974, and 1975

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C-98. Research, development, and R&D plant, by geographic division and State, fiscal year 1973
C-99. Research and development, by State and performer, fiscal year 1973
C-99A. Percent distribution to each performer, by State, fiscal year 1973
C-99B. Percent distribution to each State, by performer, fiscal year 1973
C-100. Research and development, by State and agency, fiscal year 1973
C-100A. Percent distribution of each agency, by State, fiscal year 1973
C-100B. Percent distribution of each State, by agency, fiscal year 1973
C-101. Research and development, by geographic division, State, agency, and performer, fiscal year 1973

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C-83. Life and environmental sciences, by agency and detailed field of science, fiscal year 1975 (estimated)
C-84. Engineering, by agency and detailed field of science, fiscal year 1973
C-85. Engineering, by agency and detailed field of science, fiscal year 1974 (estimated)
C-86. Engineering, by agency and detailed field of science, fiscal year 1975 (estimated)
C-87. Social sciences, by agency and detailed field of science, fiscal year 1973
C-88. Social sciences, by agency and detailed field of science, fiscal year 1974 (estimated)
C-89. Social sciences, by agency and detailed field of science, fiscal year 1975 (estimated)

FOREIGN PERFORMERS — RESEARCH AND DEVELOPMENT

C-90. By region, country, and agency, fiscal year 1973
C-91. By region, country, and agency, fiscal year 1974 (estimated)

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C-92. By region, country, and agency, fiscal year 1973
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C-98. Research, development, and R&D plant, by geographic division and State, fiscal year 1973
C-99. Research and development, by State and performer, fiscal year 1973
C-99A. Percent distribution to each performer, by State, fiscal year 1973
C-99B. Percent distribution to each State, by performer, fiscal year 1973
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C-100B. Percent distribution of each State, by agency, fiscal year 1973
C-101. Research and development, by geographic division, State, agency, and performer, fiscal year 1973
C-102. R&D plant, by geographic division, State, and performer supported, fiscal year 1973
C-103. R&D plant, by geographic division, State, and agency, fiscal year 1973

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C-104. Total research and development, by agency, fiscal years 1973, 1974, and 1975
C-105. Basic research, by agency, fiscal years 1973, 1974, and 1975
C-106. Applied research, by agency, fiscal years 1973, 1974, and 1975
C-107. Development, by agency, fiscal years 1973, 1974, and 1975

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C-108. Research, development, and R&D plant, by agency, fiscal years 1965-75
C-109. Research and development, by agency, fiscal years 1965-75
C-110. R&D plant, by agency, fiscal years 1965-75

Obligations

C-111. Research, development, and R&D plant, by agency, fiscal years 1965-75
C-112. Research and development, by agency, fiscal years 1965-75
C-113. R&D plant, by agency, fiscal years 1965-75
C-114. Research and development, by character of work and R&D plant, fiscal years 1965-75
C-115. Total research, by selected agency, fiscal years 1965-75
C-116. Basic research, by selected agency, fiscal years 1965-75
C-117. Applied research, by selected agency, fiscal years 1965-75
C-118. Development, by selected agency, fiscal years 1965-75
C-119. Research and development, by performer, fiscal years 1965-75
C-120. Total research, by performer, fiscal years 1965-75
C-121. Basic research, by performer, fiscal years 1965-75
C-122. Applied research, by performer, fiscal years 1965-75
C-123. Development, by performer, fiscal years 1965-75
C-124. Total research, by field of science, fiscal years 1965-75
C-125. Basic research, by field of science, fiscal years 1965-75
C-126. Applied research, by field of science, fiscal years 1965-75
C-127. Research and development, by geographic division and State, fiscal years 1963, 1965, 1968, 1969, 1970, 1971, 1972, and 1973
C-128. R&D plant, by geographic division and State, fiscal years 1963, 1965, 1968, 1969, 1970, 1971, 1972, and 1973

NOTES

- The source of data is the National Science Foundation, except where noted on individual tables.
- Estimates for 1975 are based on *The Budget, FY 1975*, as submitted to Congress, and do not reflect subsequent appropriation and apportionment actions.
- Asterisks appearing in lieu of figures indicate that the amounts are less than $50,000.
- The abbreviation "FFRDC" appearing in statistical tables refers to Federally Funded Research and Development Centers.
- Defense Agencies within the Department of Defense include agencies such as the Advanced Research Projects Agency, the National Security Agency, the Defense Nuclear Agency, and the Defense Communications Agency.
- Departmentwide Funds of the Department of Defense include the Defense Civil Preparedness Agency.
- The Atomic Energy Commiss
rather than obligations or ex
- In tables showing extramura
experiment stations are incl
and colleges.
- In prior years the Alcohol, D
tration, the Center for Di
Administration, and the Heal
of Health, Education, and
Health Services and Mental
- The Office of Human Develop
and Welfare includes the fo
- The Drug Enforcement A
includes the former Bureau

l Science Foundation, except where

he Budget, FY 1975, as submitted to
bsequent appropriation and appor-

gures indicate that the amounts are

earing in statistical tables refers to
Development Centers.

artment of Defense include agencies
ch Projects Agency, the National
Nuclear Agency, and the Defense

Department of Defense include the
ncy.

- The Atomic Energy Commission's R&D data reflect accrued costs rather than obligations or expenditures.
- In tables showing extramural performers, obligations to agricultural experiment stations are included under obligations to universities and colleges.
- In prior years the Alcohol, Drug Abuse and Mental Health Administration, the Center for Disease Control, the Health Resources Administration, and the Health Services Administration, Department of Health, Education, and Welfare were part of the then existing Health Services and Mental Health Administration.
- The Office of Human Development, Department of Health, Education, and Welfare includes the former Office of Child Development.
- The Drug Enforcement Administration, Department of Justice, includes the former Bureau of Narcotics and Dangerous Drugs.

Table C-1. Summary of Federal funds for research, development, and R&D plant, fiscal years 1973, 1974,

[Millions of dollars]

Item	Actual	Estimates	
	1973	1974	1975
TOTAL EXPENDITURES FOR RESEARCH, DEVELOPMENT, AND R&D PLANT	17,510.2	18,552.4	20,153.9
Research and Development	16,872.1	17,658.3	19,135.3
R&D Plant	638.0	894.1	1,018.6
TOTAL OBLIGATIONS FOR RESEARCH, DEVELOPMENT, AND R&D PLANT	17,595.6	18,715.1	20,709.6
Research and Development	16,821.2	17,743.2	19,597.1
Total Research	6,499.9	7,197.1	7,673.6
Basic Research	2,419.6	2,568.7	2,599.2
Applied Research	4,080.3	4,628.5	5,074.4
Development	10,321.3	10,546.1	11,923.5
R&D Plant	774.3	971.9	1,112.5
Research and Development			
Performers			
Federal intramural[a]	4,619.0	4,939.9	5,267.0
Industrial firms	7,874.1	7,986.7	9,311.2
FFRDC's administered by industrial firms	582.4	584.3	633.5
Universities and colleges	1,915.5	2,226.3	2,295.8
FFRDC's administered by universities and colleges	725.3	782.1	886.0
Nonprofit institutions	600.6	720.3	697.6
FFRDC's administered by nonprofit institutions	183.1	187.9	209.3
State and local governments	256.8	242.5	227.7
Foreign	64.4	73.3	69.0
Research			
Performers			
Federal intramural[a]	2,197.3	2,468.8	2,634.1
Industrial firms	1,645.4	1,640.9	1,810.5
FFRDC's administered by industrial firms	68.7	69.7	80.3
Universities and colleges	1,693.8	1,981.5	2,053.1
FFRDC's administered by universities and colleges	383.1	407.6	467.5
Nonprofit institutions	331.4	412.0	405.4
FFRDC's administered by nonprofit institutions	52.0	48.1	50.9
State and local governments	88.2	115.3	118.8
Foreign	39.9	53.4	53.0
Fields of science			
Life sciences	2,058.7	2,466.5	2,362.6
Psychology	116.4	137.7	127.9
Physical sciences	1,126.0	1,211.3	1,370.0
Environmental sciences	791.1	811.5	873.4
Mathematics	125.7	142.1	153.4
Engineering	1,760.1	1,908.7	2,225.9
Social sciences	296.3	336.7	374.1
Other sciences	225.5	182.6	186.2
Basic Research			
Performers			
Federal intramural[a]	584.8	634.9	654.6
Industrial firms	505.3	456.4	361.5
FFRDC's administered by industrial firms	39.4	38.2	44.7
Universities and colleges	923.8	1,036.1	1,123.8
FFRDC's administered by universities and colleges	251.7	263.8	288.2
Nonprofit institutions	83.4	101.9	90.1
FFRDC's administered by nonprofit institutions	4.9	3.8	4.4

Item
Basic research – Continued
State and local governments
Foreign
Fields of science
Life sciences
Psychology
Physical sciences
Environmental sciences
Mathematics
Engineering
Social sciences
Other sciences
Applied research
Performers
Federal intramural[a]
Industrial firms
FFRDC's administered by industrial firms
Universities and colleges
FFRDC's administered by universities and
Nonprofit institutions
FFRDC's administered by nonprofit insti
State and local governments
Foreign
Fields of science
Life sciences
Psychology
Physical sciences
Environmental sciences
Mathematics
Engineering
Social sciences
Other sciences
Development
Performers
Federal intramural[a]
Industrial firms
FFRDC's administered by industrial firm
Universities and colleges
FFRDC's administered by universities an
Nonprofit institutions
FFRDC's administered by nonprofit insti
State and local governments
Foreign
R&D Plant
Performers supported
Federal intramural
Industrial firms
FFRDC's administered by industrial firm
Universities and colleges
FFRDC's administered by universities an
Nonprofit institutions
FFRDC's administered by nonprofit insti
State and local governments
Foreign

[a] Intramural activities cover costs associated with the administration of intramural and extramural programs by Federal personnel as well as actual intramural performance.

SOURCE: National Science Foundation

mary of Federal funds for research, development, and R&D plant, fiscal years 1973, 1974, and 1975

[Millions of dollars]

	Actual	Estimates	
	1973	1974	1975
OPMENT,	17,510.2	18,552.4	20,153.9
	16,872.1	17,658.3	19,135.3
	638.0	894.1	1,018.6
ENT,	17,595.6	18,715.1	20,709.6
	16,821.2	17,743.2	19,597.1
	6,499.9	7,197.1	7,673.6
	2,419.6	2,568.7	2,599.2
	4,080.3	4,628.5	5,074.4
	10,321.3	10,546.1	11,923.5
	774.3	971.9	1,112.5
	4,619.0	4,939.9	5,267.0
	7,874.1	7,986.7	9,311.2
	582.4	584.3	633.5
	1,915.5	2,226.3	2,295.8
	725.3	782.1	886.0
	600.6	720.3	697.6
	183.1	187.9	209.3
	256.8	242.5	227.7
	64.4	73.3	69.0
	2,197.3	2,468.8	2,634.1
	1,645.4	1,640.9	1,810.5
	68.7	69.7	80.3
	1,693.8	1,981.5	2,053.1
	383.1	407.6	467.5
	331.4	412.0	405.4
	52.0	48.1	50.9
	88.2	115.3	118.8
	39.9	53.4	53.0
	2,058.7	2,466.5	2,362.6
	116.4	137.7	127.9
	1,126.0	1,211.3	1,370.0
	791.1	811.5	873.4
	125.7	142.1	153.4
	1,760.1	1,908.7	2,225.9
	296.3	336.7	374.1
	225.5	182.6	186.2
	584.8	634.9	654.6
	505.3	456.4	361.5
	39.4	38.2	44.7
	923.8	1,036.1	1,123.8
	251.7	263.8	288.2
	83.4	101.9	90.1
	4.9	3.8	4.4

Item	Actual	Estimates	
	1973	1974	1975
Basic research – Continued			
State and local governments	14.4	17.0	14.8
Foreign	12.0	16.7	17.1
Fields of science			
Life sciences	758.3	869.1	799.9
Psychology	50.9	62.1	55.3
Physical sciences	795.8	829.5	880.3
Environmental sciences	444.7	429.8	418.2
Mathematics	57.1	56.0	62.5
Engineering	206.2	209.1	268.1
Social sciences	78.3	91.1	100.2
Other sciences	28.4	21.9	14.7
Applied research			
Performers			
Federal intramural[a]	1,612.6	1,833.9	1,979.5
Industrial firms	1,140.2	1,184.5	1,449.0
FFRDC's administered by industrial firms	29.3	31.4	35.6
Universities and colleges	770.0	945.5	929.3
FFRDC's administered by universities and colleges	131.4	143.8	179.3
Nonprofit institutions	248.0	310.1	315.3
FFRDC's administered by nonprofit institutions	47.1	44.3	46.5
State and local governments	73.8	98.3	104.0
Foreign	27.9	36.7	35.9
Fields of science			
Life sciences	1,300.5	1,597.3	1,562.6
Psychology	65.5	75.6	72.6
Physical sciences	330.2	381.7	489.7
Environmental sciences	346.4	381.7	455.3
Mathematics	68.7	86.2	91.0
Engineering	1,553.9	1,699.5	1,957.8
Social sciences	217.9	245.7	273.9
Other sciences	197.1	160.7	171.5
Development			
Performers			
Federal intramural[a]	2,421.7	2,471.1	2,632.9
Industrial firms	6,228.7	6,345.9	7,500.6
FFRDC's administered by industrial firms	513.6	514.6	553.3
Universities and colleges	221.8	244.8	242.7
FFRDC's administered by universities and colleges	342.2	374.5	418.5
Nonprofit institutions	269.2	308.2	292.1
FFRDC's administered by nonprofit institutions	131.1	139.8	158.4
State and local governments	168.7	127.2	108.9
Foreign	24.5	19.9	16.0
R&D Plant			
Performers supported			
Federal intramural	323.8	409.5	426.2
Industrial firms	76.8	130.7	191.3
FFRDC's administered by industrial firms	145.0	208.4	253.4
Universities and colleges	42.6	49.2	45.0
FFRDC's administered by universities and colleges	162.3	134.1	154.1
Nonprofit institutions	15.8	34.0	36.2
FFRDC's administered by nonprofit institutions	3.1	2.2	4.3
State and local governments	3.0	3.5	1.8
Foreign	1.9	.4	.3

the administration of intramural and extramural
ntramural performance.

TABLE C-2. FEDERAL FUNDS FOR RESEARCH, DEVELOPMENT, AND R&D PLANT, BY AGENCY, FISCAL YEARS 1973, 1974, AND 1975

(MILLIONS OF DOLLARS)

AGENCY AND SUBDIVISION	OBLIGATIONS			EXPENDITURES		
		ESTIMATES			ESTIMATES	
	ACTUAL, 1973	1974	1975	ACTUAL, 1973	1974	1975
TOTAL, ALL AGENCIES	17,595.6	18,715.1	20,789.6	17,510.2	18,552.4	20,153.9
DEPARTMENTS						
DEPARTMENT OF AGRICULTURE, TOTAL	369.4	397.1	413.5	357.1	397.0	423.8
AGRICULTURAL RESEARCH SERVICE	201.2	215.4	226.4	199.3	220.1	236.5
COOPERATIVE STATE RESEARCH SERVICE	89.4	90.0	98.6	82.1	90.3	96.1
ECONOMIC RESEARCH SERVICE	16.9	18.7	20.9	15.2	18.7	20.9
FARMER COOPERATIVE SERVICE	1.2	1.4	1.4	1.1	1.4	1.4
FOREST SERVICE	59.6	71.0	65.2	58.3	65.9	68.1
NATIONAL AGRICULTURAL LIBRARY	.3	.1	.1	.3	.2	.1
STATISTICAL REPORTING SERVICE	.7	.6	.8	.7	.6	.8
DEPARTMENT OF COMMERCE, TOTAL	198.5	222.0	274.7	186.2	202.1	242.6
ECONOMIC DEVELOPMENT ADMINISTRATION	6.3	7.4	1.6	5.1	4.4	3.3
MARITIME ADMINISTRATION	25.9	26.1	29.7	22.5	20.6	26.1
NATIONAL BUREAU OF FIRE PREVENTION	-	-	5.6	-	-	3.0
NATIONAL BUREAU OF STANDARDS	38.9	47.5	49.5	36.8	43.0	46.8
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	119.3	133.4	145.1	114.4	126.2	135.6
OFFICE OF MINORITY BUSINESS ENTERPRISE	2.1	1.4	39.3	1.4	1.8	24.1
OFFICE OF TELECOMMUNICATIONS	3.5	3.0	1.3	3.5	3.6	1.3
PATENT OFFICE	.6	.8	.8	.6	.7	.8
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION	1.0	1.1	1.0	1.0	1.1	1.0
US TRAVEL SERVICE	.8	.9	.9	.8	.8	.8
DEPARTMENT OF DEFENSE, TOTAL	8,550.6	8,800.0	9,797.0	8,597.6	8,875.9	9,355.0
DEPARTMENT OF THE ARMY	2,030.7	2,109.1	2,087.9	2,042.4	2,061.1	2,054.1
MILITARY FUNCTIONS	2,020.6	2,097.2	2,075.9	2,030.6	2,049.4	2,042.3
RDT&E APPROPRIATIONS	1,928.1	1,970.0	1,976.0	1,912.1	1,932.0	1,945.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	84.7	90.0	88.7	83.3	89.4	88.4
MILITARY CONSTRUCTION	7.9	37.1	11.2	35.2	28.0	8.9
CIVIL FUNCTIONS	10.1	12.0	12.0	11.8	11.8	11.8
DEPARTMENT OF THE NAVY	2,690.5	2,857.2	3,357.9	2,498.9	2,671.4	3,126.3
RDT&E APPROPRIATIONS	2,590.1	2,736.3	3,250.7	2,404.2	2,572.0	3,013.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	86.3	87.7	84.7	86.0	87.4	84.6
MILITARY CONSTRUCTION	10.5	29.0	20.1	7.5	9.5	26.1
SPECIAL FOREIGN CURRENCY PROGRAM	3.6	4.2	2.4	1.2	2.5	2.6
DEPARTMENT OF THE AIR FORCE	3,344.1	3,326.3	3,790.3	3,588.5	3,641.9	3,654.9
RDT&E APPROPRIATIONS	3,115.5	3,093.1	3,520.6	3,361.9	3,406.0	3,411.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	210.6	218.4	227.8	210.6	218.4	227.8
MILITARY CONSTRUCTION	18.0	14.9	41.9	16.0	17.6	16.1
DEFENSE AGENCIES	457.1	477.9	533.9	461.3	478.1	492.6
RDT&E APPROPRIATIONS	449.1	470.6	526.7	456.0	470.2	484.7
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	5.3	6.9	6.9	5.3	6.9	6.9
MILITARY CONSTRUCTION	2.6	.4	.3	-	.9	1.0
DEPARTMENTWIDE FUNDS	3.2	3.4	3.0	3.0	3.3	3.2
DIRECTOR OF TEST AND EVALUATION, DEFENSE	25.1	26.0	24.1	3.4	20.0	24.0
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, TOTAL	1,879.1	2,413.0	2,265.4	1,878.4	2,274.4	2,454.8
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION	122.2	159.1	131.1	112.6	133.1	133.8
CENTER FOR DISEASE CONTROL	30.6	36.0	36.6	36.1	39.0	34.8
FOOD AND DRUG ADMINISTRATION	38.4	42.6	41.2	24.3	35.1	41.5
HEALTH RESOURCES ADMINISTRATION	52.7	63.5	57.2	68.0	63.6	60.8
HEALTH SERVICES ADMINISTRATION	13.2	13.9	16.2	13.6	14.3	15.4
NATIONAL INSTITUTE OF EDUCATION	106.8	100.7	130.0	35.0	96.0	114.0
NATIONAL INSTITUTES OF HEALTH	1,355.5	1,809.6	1,698.3	1,373.7	1,698.6	1,850.0
OFFICE OF EDUCATION	58.3	56.6	15.5	102.2	64.3	58.9
OFFICE OF HUMAN DEVELOPMENT	28.0	32.6	44.9	28.0	32.6	44.9
OFFICE OF INTERNATIONAL HEALTH	.7	.8	*	.7	.6	*
OFFICE OF THE SECRETARY	-	31.7	33.7	-	17.0	33.0
SOCIAL AND REHABILITATION SERVICE	53.5	39.9	33.5	64.1	55.3	47.0
SOCIAL SECURITY ADMINISTRATION	18.5	25.1	27.2	18.4	25.0	27.0
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	57.0	65.3	76.3	47.0	57.0	73.3

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	119.3	133.4	145.1	114.4	126.2	135.6
OFFICE OF MINORITY BUSINESS ENTERPRISE	2.1	1.4	39.3	1.4	1.8	24.1
OFFICE OF TELECOMMUNICATIONS	3.5	3.6	1.3	3.5	3.6	1.3
PATENT OFFICE	.6	.8	.8	.6	.7	.8
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION	1.0	1.1	1.0	1.0	1.1	1.0
US TRAVEL SERVICE	.8	.9	.9	.8	.8	.8
DEPARTMENT OF DEFENSE, TOTAL	8,550.6	8,800.0	9,797.0	8,597.6	8,875.9	9,355.0
DEPARTMENT OF THE ARMY	2,030.7	2,109.1	2,087.9	2,042.4	2,061.1	2,054.1
MILITARY FUNCTIONS	2,020.6	2,097.2	2,075.9	2,030.6	2,049.4	2,042.3
RDT&E APPROPRIATIONS	1,928.1	1,970.0	1,976.0	1,912.1	1,932.0	1,945.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	84.7	90.0	88.7	83.3	89.4	88.4
MILITARY CONSTRUCTION	7.9	37.1	11.2	35.2	28.0	8.9
CIVIL FUNCTIONS	10.1	12.0	12.0	11.8	11.8	11.8
DEPARTMENT OF THE NAVY	2,690.5	2,857.2	3,357.9	2,498.9	2,671.4	3,126.3
RDT&E APPROPRIATIONS	2,590.1	2,736.3	3,250.8	2,404.2	2,572.0	3,013.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	86.3	87.7	84.7	86.0	87.4	84.6
MILITARY CONSTRUCTION	10.5	29.0	20.1	7.5	9.5	26.1
SPECIAL FOREIGN CURRENCY PROGRAM	3.6	4.2	2.4	1.2	2.5	2.6
DEPARTMENT OF THE AIR FORCE	3,344.1	3,326.3	3,790.3	3,588.5	3,641.9	3,654.9
RDT&E APPROPRIATIONS	3,115.5	3,093.1	3,520.6	3,361.9	3,406.0	3,411.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	218.6	218.4	227.8	210.6	218.4	227.8
MILITARY CONSTRUCTION	10.0	14.9	41.9	16.0	17.6	16.1
DEFENSE AGENCIES	457.1	477.9	533.9	461.3	478.1	492.6
RDT&E APPROPRIATIONS	449.1	470.6	526.7	456.0	470.2	484.7
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	5.3	6.9	6.9	5.3	6.9	6.9
MILITARY CONSTRUCTION	2.6	.4	.3	-	.9	1.0
DEPARTMENTWIDE FUNDS	3.2	3.4	3.0	3.0	3.3	3.2
DIRECTOR OF TEST AND EVALUATION, DEFENSE	25.1	26.0	24.1	3.4	20.0	24.0
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, TOTAL	1,879.1	2,413.0	2,265.4	1,878.4	2,274.4	2,454.0
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION	122.2	159.1	131.1	112.6	133.1	133.0
CENTER FOR DISEASE CONTROL	38.6	36.8	36.6	36.1	39.0	34.8
FOOD AND DRUG ADMINISTRATION	38.4	42.6	41.2	24.3	35.1	41.5
HEALTH RESOURCES ADMINISTRATION	52.7	63.5	57.2	68.0	63.6	60.0
HEALTH SERVICES ADMINISTRATION	13.2	13.9	16.2	13.6	14.3	15.4
NATIONAL INSTITUTE OF EDUCATION	106.8	100.7	130.0	35.8	96.0	114.0
NATIONAL INSTITUTES OF HEALTH	1,355.5	1,809.6	1,698.3	1,373.7	1,698.6	1,850.0
OFFICE OF EDUCATION	50.3	56.6	15.5	102.2	64.3	50.9
OFFICE OF HUMAN DEVELOPMENT	28.8	32.6	44.9	28.8	32.6	44.9
OFFICE OF INTERNATIONAL HEALTH	.7	.8	*	.7	.6	*
OFFICE OF THE SECRETARY	-	31.7	33.7	-	17.0	33.0
SOCIAL AND REHABILITATION SERVICE	53.5	39.9	33.5	64.1	55.3	47.0
SOCIAL SECURITY ADMINISTRATION	18.5	25.1	27.2	18.4	25.0	27.0
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	57.0	65.3	76.3	47.8	57.8	73.3
DEPARTMENT OF THE INTERIOR, TOTAL	265.5	373.0	719.2	254.1	334.3	576.0
BONNEVILLE POWER ADMINISTRATION	3.0	3.3	9.6	2.6	3.4	4.7
BUREAU OF LAND MANAGEMENT	.7	.7	10.4	.7	.7	10.4
BUREAU OF MINES	77.5	90.1	195.5	68.6	87.5	163.5
BUREAU OF OUTDOOR RECREATION	*	*	-	*	*	-
BUREAU OF RECLAMATION	9.7	7.3	6.6	9.5	8.1	6.6
BUREAU OF SPORT FISHERIES AND WILDLIFE	24.9	28.9	33.0	27.9	28.7	33.2
GEOLOGICAL SURVEY	67.0	70.6	102.9	62.7	69.1	100.0
NATIONAL PARK SERVICE	1.5	2.2	2.2	1.5	2.2	2.2
OFFICE OF COAL RESEARCH	46.4	134.8	296.4	36.5	99.0	264.0
OFFICE OF THE SECRETARY	21.3	22.9	50.8	31.0	23.4	30.6
OFFICE OF WATER RESOURCES RESEARCH	13.3	12.3	11.8	13.1	12.3	12.1
DEPARTMENT OF JUSTICE, TOTAL	33.2	50.3	53.4	22.2	42.5	53.0
BUREAU OF PRISONS	.5	.6	.6	.5	.6	.6
DRUG ENFORCEMENT ADMINISTRATION	1.6	6.5	6.6	.9	2.8	3.9
FEDERAL BUREAU OF INVESTIGATION	.7	1.9	1.0	.9	.5	.5
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION	30.4	41.3	45.2	19.9	38.6	48.0
DEPARTMENT OF LABOR, TOTAL	19.9	21.5	21.6	18.3	22.0	21.4
BUREAU OF LABOR STATISTICS	1.0	1.7	2.3	1.0	1.7	2.3
EMPLOYMENT STANDARDS ADMINISTRATION	1.3	.9	.9	1.3	.9	.9
LABOR-MANAGEMENT SERVICES ADMINISTRATION	.9	1.2	1.2	.4	1.6	1.2
MANPOWER ADMINISTRATION	14.6	14.9	14.9	14.6	14.9	14.9
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	.9	.8	.8	.3	1.4	1.0
OFFICE OF THE SECRETARY	1.2	2.0	1.5	.7	1.6	1.1

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TABLE C-2. FEDERAL FUNDS FOR RESEARCH, DEVELOPMENT, AND R&D PLANT, BY AGENCY, FISCAL YEARS 1973, 1974, AND 1975

CONTINUED (MILLIONS OF DOLLARS)

AGENCY AND SUBDIVISION	OBLIGATIONS			EXPENDITURES		
		ESTIMATES			ESTIMATES	
	ACTUAL, 1973	1974	1975	ACTUAL, 1973	1974	1975
DEPARTMENT OF STATE, TOTAL	26.6	27.1	31.9	20.8	21.9	23.7
DEPARTMENTAL FUNDS	1.5	1.5	2.0	1.5	1.5	2.0
AGENCY FOR INTERNATIONAL DEVELOPMENT	25.1	25.6	29.9	19.3	20.4	21.7
DEPARTMENT OF TRANSPORTATION, TOTAL	348.9	390.0	416.6	337.3	371.4	385.6
FEDERAL AVIATION ADMINISTRATION	81.0	101.3	96.3	88.6	94.9	94.7
FEDERAL HIGHWAY ADMINISTRATION	23.7	35.4	43.1	23.5	40.3	38.6
FEDERAL RAILROAD ADMINISTRATION	46.9	49.4	64.2	41.4	36.3	52.5
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	54.6	66.1	56.9	47.6	67.4	51.5
OFFICE OF THE SECRETARY	23.6	33.6	45.5	24.5	32.6	38.0
UNITED STATES COAST GUARD	44.8	35.4	31.5	39.5	34.3	35.3
URBAN MASS TRANSPORTATION ADMINISTRATION	74.4	69.0	79.0	72.2	65.6	75.0
DEPARTMENT OF THE TREASURY, TOTAL	1.0	1.5	1.5	1.0	1.5	1.5
BUREAU OF ENGRAVING AND PRINTING	1.0	1.5	1.5	1.0	1.5	1.5
OTHER AGENCIES						
ACTION	-	-	.3	-	-	.3
ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS	.9	1.1	1.1	.8	1.1	1.2
ATOMIC ENERGY COMMISSION	1,712.3	1,818.1	2,152.3	1,624.4	1,816.8	2,150.6
CIVIL AERONAUTICS BOARD	.3	.3	.3	.3	.3	.3
CIVIL SERVICE COMMISSION	2.4	3.1	4.3	2.4	3.1	4.3
CONSUMER PRODUCT SAFETY COMMISSION	.3	8.9	10.0	*	7.2	8.4
ENVIRONMENTAL PROTECTION AGENCY	205.1	186.7	345.6	147.7	189.4	284.6
FEDERAL COMMUNICATIONS COMMISSION	1.1	1.4	1.5	.7	1.5	1.5
FEDERAL HOME LOAN BANK BOARD	.5	.6	.7	.5	.6	.7
FEDERAL TRADE COMMISSION	.7	.9	1.0	.7	.9	1.0
GENERAL SERVICES ADMINISTRATION	.5	16.0	16.6	.5	16.0	16.6
LIBRARY OF CONGRESS	2.6	2.5	2.0	2.5	2.4	2.6
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	3,130.2	3,127.1	3,222.6	3,315.2	3,179.2	3,274.9
NATIONAL SCIENCE FOUNDATION	537.0	568.7	714.0	470.9	580.0	593.0
OFFICE OF ECONOMIC OPPORTUNITY	108.9	49.5	-	98.8	50.6	25.7
OFFICE OF TELECOMMUNICATIONS POLICY	.6	.7	1.3	.8	.9	1.0
SMALL BUSINESS ADMINISTRATION	-	-	.2	-	-	.2
SMITHSONIAN INSTITUTION	24.1	26.2	25.0	22.0	24.3	24.5
SPECIAL ACTION OFFICE FOR DRUG ABUSE PREVENTION	12.0	20.0	4.0	*	14.2	11.0
TENNESSEE VALLEY AUTHORITY	18.8	32.2	33.0	16.4	31.2	37.2
UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY	2.0	1.0	1.5	2.0	1.7	1.6
UNITED STATES INFORMATION AGENCY	.1	.1	.1	.1	.1	.1
VETERANS ADMINISTRATION	84.6	88.4	98.9	82.8	93.4	102.1

TABLE C-3. FEDERAL FUNDS FOR TOTAL RESEARCH AND DEVELOPMENT, BY AGENCY, FISCAL YEARS 1973, 1974, AND 1975

(MILLIONS OF DOLLARS)

AGENCY AND SUBDIVISION	OBLIGATIONS			EXPENDITURES		
		ESTIMATES			ESTIMATES	
	ACTUAL, 1973	1974	1975	ACTUAL, 1973	1974	1975
TOTAL, ALL AGENCIES	16,821.2	17,743.2	19,597.1	16,872.1	17,658.3	19,135.3
DEPARTMENTS						
DEPARTMENT OF AGRICULTURE, TOTAL	366.5	386.4	405.9	348.5	387.0	413.6
AGRICULTURAL RESEARCH SERVICE	199.5	211.1	218.8	194.7	215.5	229.2
COOPERATIVE STATE RESEARCH SERVICE	89.4	90.0	98.6	81.8	90.0	96.0
ECONOMIC RESEARCH SERVICE	16.9	18.7	20.9	15.2	18.7	20.9
FARMER COOPERATIVE SERVICE	1.2	1.4	1.4	1.1	1.4	1.4
FOREST SERVICE	58.4	64.5	65.2	54.7	60.7	65.1
NATIONAL AGRICULTURAL LIBRARY	.3	.1	.1	.3	.2	.1
STATISTICAL REPORTING SERVICE	.7	.6	.8	.7	.6	.8
DEPARTMENT OF COMMERCE, TOTAL	190.6	210.1	262.8	180.4	192.2	229.7
ECONOMIC DEVELOPMENT ADMINISTRATION	6.3	7.4	1.6	5.1	4.4	3.3
MARITIME ADMINISTRATION	23.8	25.0	28.6	21.4	19.2	25.0
NATIONAL BUREAU OF FIRE PREVENTION	-	-	5.6	-	-	3.0
NATIONAL BUREAU OF STANDARDS	36.8	45.3	48.4	35.6	42.6	44.2
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	115.6	124.7	135.3	110.9	118.8	126.4
OFFICE OF MINORITY BUSINESS ENTERPRISE	2.1	1.4	39.3	1.4	1.0	24.1
OFFICE OF TELECOMMUNICATIONS	3.5	3.6	1.3	3.5	3.6	1.3
PATENT OFFICE	.6	.8	.8	.6	.7	.8
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION	1.0	1.1	1.0	1.0	1.1	1.0
US TRAVEL SERVICE	.8	.9	.9	.8	.8	.8
DEPARTMENT OF DEFENSE, TOTAL	8,404.2	8,598.5	9,607.9	8,440.6	8,701.1	9,187.3
DEPARTMENT OF THE ARMY	2,013.6	2,061.5	2,067.9	1,996.4	2,024.1	2,036.3
MILITARY FUNCTIONS	2,003.5	2,049.5	2,055.9	1,984.6	2,012.3	2,024.5
RDT&E APPROPRIATIONS	1,918.8	1,959.5	1,967.2	1,901.3	1,922.9	1,936.1
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	84.7	90.0	88.7	83.3	89.4	88.4
CIVIL FUNCTIONS	10.1	12.0	12.0	11.8	11.8	11.8
DEPARTMENT OF THE NAVY	2,654.8	2,787.5	3,296.5	2,466.4	2,622.9	3,060.2
RDT&E APPROPRIATIONS	2,564.9	2,695.6	3,209.5	2,379.2	2,533.0	2,973.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	86.3	87.7	84.7	86.0	87.4	84.6
SPECIAL FOREIGN CURRENCY PROGRAM	3.6	4.2	2.4	1.2	2.5	2.6
DEPARTMENT OF THE AIR FORCE	3,273.5	3,261.2	3,700.2	3,533.1	3,573.6	3,590.1
RDT&E APPROPRIATIONS	3,062.9	3,042.9	3,472.4	3,322.5	3,355.2	3,362.3
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	210.6	218.4	227.8	210.6	218.4	227.8
DEFENSE AGENCIES	434.1	458.9	516.3	438.3	457.2	473.6
RDT&E APPROPRIATIONS	428.7	451.9	509.4	432.9	450.2	466.7
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	5.3	6.9	6.9	5.3	6.9	6.9
DEPARTMENTWIDE FUNDS	3.2	3.4	3.0	3.0	3.3	3.2
DIRECTOR OF TEST AND EVALUATION, DEFENSE	25.1	26.0	24.1	3.4	20.0	24.0
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, TOTAL	1,837.6	2,347.2	2,232.5	1,815.7	2,203.2	2,375.0
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION	122.2	159.1	131.1	112.6	133.1	133.0
CENTER FOR DISEASE CONTROL	38.6	36.8	36.6	36.1	39.0	34.8
FOOD AND DRUG ADMINISTRATION	30.2	37.7	40.4	24.1	34.4	39.0
HEALTH RESOURCES ADMINISTRATION	52.7	63.5	57.2	54.1	55.0	55.5
HEALTH SERVICES ADMINISTRATION	13.2	13.9	16.2	13.6	14.3	15.4
NATIONAL INSTITUTE OF EDUCATION	106.8	108.7	130.0	35.0	96.0	114.0
NATIONAL INSTITUTES OF HEALTH	1,314.2	1,740.8	1,666.2	1,333.3	1,640.1	1,778.2
OFFICE OF EDUCATION	58.3	56.6	15.5	96.0	60.7	50.9
OFFICE OF HUMAN DEVELOPMENT	28.8	32.6	44.9	28.8	32.6	44.9
OFFICE OF INTERNATIONAL HEALTH	.7	.8	*	.7	.6	*
OFFICE OF THE SECRETARY	-	31.7	33.7	-	17.0	33.0
SOCIAL AND REHABILITATION SERVICE	53.5	39.9	33.5	64.1	55.3	47.8
SOCIAL SECURITY ADMINISTRATION	18.5	25.1	27.2	10.4	25.0	27.8
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	57.8	65.3	76.3	47.8	57.8	73.3
DEPARTMENT OF THE INTERIOR, TOTAL	243.4	286.1	557.4	237.8	280.9	498.7
BONNEVILLE POWER ADMINISTRATION	2.8	3.2	9.5	2.2	3.2	4.6
	.7	.7	18.4	.7	.7	10.4

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MARITIME ADMINISTRATION	23.0	29.0	[illegible]	[illegible]	[illegible]	[illegible]
NATIONAL BUREAU OF FIRE PREVENTION	-	-	5.6	-	-	3.0
NATIONAL BUREAU OF STANDARDS	36.0	45.3	48.4	35.6	42.6	44.2
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	115.6	124.7	135.3	118.9	118.0	126.4
OFFICE OF MINORITY BUSINESS ENTERPRISE	2.1	1.4	39.3	1.4	1.0	24.1
OFFICE OF TELECOMMUNICATIONS	3.5	3.6	1.3	3.5	3.6	1.3
PATENT OFFICE	.6	.8	.8	.6	.7	.8
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION	1.0	1.1	1.0	1.0	1.1	1.0
US TRAVEL SERVICE	.8	.9	.9	.8	.8	.8
DEPARTMENT OF DEFENSE, TOTAL	8,404.2	8,598.5	9,607.9	8,440.6	8,701.1	9,187.3
DEPARTMENT OF THE ARMY	2,013.6	2,061.5	2,067.9	1,996.4	2,024.1	2,036.3
MILITARY FUNCTIONS	2,003.5	2,049.5	2,055.9	1,984.6	2,012.3	2,024.5
RDT&E APPROPRIATIONS	1,918.8	1,959.5	1,967.2	1,901.3	1,922.9	1,936.1
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	84.7	90.0	88.7	83.3	89.4	88.4
CIVIL FUNCTIONS	10.1	12.0	12.0	11.8	11.8	11.8
DEPARTMENT OF THE NAVY	2,654.8	2,787.5	3,296.5	2,466.4	2,622.9	3,060.2
RDT&E APPROPRIATIONS	2,564.9	2,695.6	3,209.5	2,379.2	2,533.0	2,973.0
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	86.3	87.7	84.7	86.0	87.4	84.6
SPECIAL FOREIGN CURRENCY PROGRAM	3.6	4.2	2.4	1.2	2.5	2.6
DEPARTMENT OF THE AIR FORCE	3,273.5	3,261.2	3,700.2	3,533.1	3,573.6	3,590.1
RDT&E APPROPRIATIONS	3,062.9	3,042.9	3,472.4	3,322.5	3,355.2	3,362.3
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	210.6	218.4	227.8	210.6	218.4	227.8
DEFENSE AGENCIES	434.1	458.9	516.3	438.3	457.2	473.6
RDT&E APPROPRIATIONS	428.7	451.9	509.4	432.9	450.2	466.7
PAY AND ALLOWANCES OF MILITARY PERSONNEL IN R&D	5.3	6.9	6.9	5.3	6.9	6.9
DEPARTMENTWIDE FUNDS	3.2	3.4	3.8	3.0	3.3	3.2
DIRECTOR OF TEST AND EVALUATION, DEFENSE	29.1	26.0	24.1	3.4	20.0	24.0
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, TOTAL	1,837.6	2,347.2	2,232.5	1,815.7	2,283.2	2,375.8
ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION	122.2	159.1	131.1	112.6	133.1	133.8
CENTER FOR DISEASE CONTROL	38.6	36.8	36.6	36.1	39.0	34.0
FOOD AND DRUG ADMINISTRATION	30.2	37.7	40.4	24.1	34.4	39.0
HEALTH RESOURCES ADMINISTRATION	52.7	63.5	57.2	54.1	55.0	55.5
HEALTH SERVICES ADMINISTRATION	13.2	13.9	16.2	13.6	14.3	15.4
NATIONAL INSTITUTE OF EDUCATION	106.0	100.7	130.0	35.8	96.0	114.0
NATIONAL INSTITUTES OF HEALTH	1,314.2	1,740.8	1,666.2	1,333.3	1,640.1	1,778.2
OFFICE OF EDUCATION	58.3	56.6	15.5	94.0	60.7	50.9
OFFICE OF HUMAN DEVELOPMENT	20.0	32.6	44.9	20.6	32.6	44.9
OFFICE OF INTERNATIONAL HEALTH	.7	.8	*	.7	.6	*
OFFICE OF THE SECRETARY	-	31.7	33.7	-	17.0	33.8
SOCIAL AND REHABILITATION SERVICE	53.5	39.9	33.5	64.1	55.3	47.8
SOCIAL SECURITY ADMINISTRATION	18.5	25.1	27.2	18.4	25.0	27.8
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	57.0	65.3	76.3	47.4	57.0	73.3
DEPARTMENT OF THE INTERIOR, TOTAL	243.4	286.1	957.4	237.0	280.9	490.7
BONNEVILLE POWER ADMINISTRATION	2.8	3.2	9.5	2.2	3.2	4.6
BUREAU OF LAND MANAGEMENT	.7	.7	10.4	.7	.7	10.4
BUREAU OF MINES	77.5	90.1	195.5	60.6	87.5	163.5
BUREAU OF OUTDOOR RECREATION	*	*	-	*	*	-
BUREAU OF RECLAMATION	9.7	7.3	6.6	9.5	8.1	6.6
BUREAU OF SPORT FISHERIES AND WILDLIFE	23.7	27.6	29.6	26.7	27.5	30.1
GEOLOGICAL SURVEY	66.3	70.6	102.9	62.5	68.6	100.0
NATIONAL PARK SERVICE	1.5	2.2	2.2	1.5	2.2	2.2
OFFICE OF COAL RESEARCH	26.5	49.9	130.1	22.3	47.0	130.0
OFFICE OF THE SECRETARY	21.3	22.4	50.0	30.7	23.0	30.5
OFFICE OF WATER RESOURCES RESEARCH	13.3	12.3	11.0	13.1	12.3	12.1
DEPARTMENT OF JUSTICE, TOTAL	33.2	50.3	53.4	22.2	42.5	53.0
BUREAU OF PRISONS	.5	.6	.6	.5	.6	.6
DRUG ENFORCEMENT ADMINISTRATION	1.6	6.5	6.6	.9	2.8	3.9
FEDERAL BUREAU OF INVESTIGATION	.7	1.9	1.0	.9	.5	.5
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION	30.4	41.3	45.2	19.9	38.6	48.0
DEPARTMENT OF LABOR, TOTAL	19.9	21.5	21.6	18.3	22.0	21.4
BUREAU OF LABOR STATISTICS	1.0	1.7	2.3	1.0	1.7	2.3
EMPLOYMENT STANDARDS ADMINISTRATION	1.3	.9	.9	1.3	.9	.9
LABOR-MANAGEMENT SERVICES ADMINISTRATION	.9	1.2	1.2	.4	1.6	1.2
MANPOWER ADMINISTRATION	14.6	14.9	14.9	14.6	14.9	14.9
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	.9	.8	.8	.3	1.4	1.0
OFFICE OF THE SECRETARY	1.2	2.0	1.5	.7	1.6	1.1

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TABLE C-3. FEDERAL FUNDS FOR TOTAL RESEARCH AND DEVELOPMENT, BY AGENCY, FISCAL YEARS 1973, 1974, AND 1975

CONTINUED (MILLIONS OF DOLLARS)

AGENCY AND SUBDIVISION	OBLIGATIONS			EXPENDITURES		
		ESTIMATES			ESTIMATES	
	ACTUAL, 1973	1974	1975	ACTUAL, 1973	1974	1975
DEPARTMENT OF STATE, TOTAL	26.2	26.5	31.6	20.2	21.2	23.2
DEPARTMENTAL FUNDS	1.5	1.5	2.0	1.5	1.5	2.0
AGENCY FOR INTERNATIONAL DEVELOPMENT	24.7	25.0	29.6	18.7	19.7	21.2
DEPARTMENT OF TRANSPORTATION, TOTAL	310.6	358.1	396.5	312.3	341.8	363.8
FEDERAL AVIATION ADMINISTRATION	79.5	96.5	93.7	88.1	91.0	92.7
FEDERAL HIGHWAY ADMINISTRATION	23.6	35.0	42.7	23.4	40.0	38.2
FEDERAL RAILROAD ADMINISTRATION	35.5	32.9	53.5	31.8	23.5	43.5
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION	54.6	66.1	56.9	47.6	67.4	51.5
OFFICE OF THE SECRETARY	23.6	33.6	45.5	24.5	32.6	38.0
UNITED STATES COAST GUARD	27.7	29.8	30.6	28.0	30.7	28.5
URBAN MASS TRANSPORTATION ADMINISTRATION	66.2	64.3	73.6	69.0	56.6	71.4
DEPARTMENT OF THE TREASURY, TOTAL	1.0	1.4	1.5	1.0	1.4	1.5
BUREAU OF ENGRAVING AND PRINTING	1.0	1.4	1.5	1.0	1.4	1.5
OTHER AGENCIES						
ACTION	-	-	.3	-	-	.3
ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS	.9	1.1	1.1	.8	1.1	1.2
ATOMIC ENERGY COMMISSION	1,363.2	1,430.9	1,703.9	1,363.2	1,430.9	1,703.9
CIVIL AERONAUTICS BOARD	.3	.3	.3	.3	.3	.3
CIVIL SERVICE COMMISSION	2.4	3.1	4.3	2.4	3.1	4.3
CONSUMER PRODUCT SAFETY COMMISSION	.3	6.4	5.5	*	4.0	4.1
ENVIRONMENTAL PROTECTION AGENCY	180.6	174.0	342.5	144.7	180.4	260.9
FEDERAL COMMUNICATIONS COMMISSION	1.1	1.4	1.5	.7	1.5	1.5
FEDERAL HOME LOAN BANK BOARD	.5	.6	.7	.5	.6	.7
FEDERAL TRADE COMMISSION	.7	.9	1.0	.7	.9	1.0
GENERAL SERVICES ADMINISTRATION	.5	16.0	16.6	.5	16.0	16.6
LIBRARY OF CONGRESS	2.6	2.5	2.0	2.5	2.4	2.6
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	3,060.9	3,026.0	3,071.2	3,270.5	3,104.2	3,172.9
NATIONAL SCIENCE FOUNDATION	479.9	529.7	653.2	427.0	460.0	540.0
OFFICE OF ECONOMIC OPPORTUNITY	100.9	49.5	-	98.0	58.6	25.7
OFFICE OF TELECOMMUNICATIONS POLICY	.6	.7	1.3	.8	.9	1.0
SMALL BUSINESS ADMINISTRATION	-	-	.2	-	-	.2
SMITHSONIAN INSTITUTION	24.0	25.1	25.6	22.7	23.6	23.9
SPECIAL ACTION OFFICE FOR DRUG ABUSE PREVENTION	12.0	20.0	4.0	*	14.2	11.0
TENNESSEE VALLEY AUTHORITY	14.3	16.6	10.4	14.3	16.6	10.4
UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY	2.0	1.0	1.5	2.0	1.7	1.6
UNITED STATES INFORMATION AGENCY	.1	.1	.1	.1	.1	.1
VETERANS ADMINISTRATION	74.3	84.9	93.9	75.0	84.7	93.0

APPENDIX D

A Listing of Statistical Tables

Part II

Federal Funds for Scientific and Technical Information

D-1. Summary, fiscal years 1973, 1974, and 1975 .....
D-2. By agency, fiscal years 1973, 1974, and 1975 .....
D-3. Intramural and extramural obligations, by agency, fiscal years 1973, 1974, and 1975 ....
D-4. By agency and activity, fiscal year 1973 ....
D-5. By agency and activity, fiscal year 1974 (estimated)
D-6. By agency and activity, fiscal year 1975 (estimated)
D-7. Intramural and extramural obligations, by agency and activity, fiscal year 1973 ....
D-8. Intramural and extramural obligations, by agency and activity, fiscal year 1974 (estimated).........
D-9. Intramural and extramural obligations, by agency and activity, fiscal year 1975 (estimated).........

Other Science Resources Publications

REPORTS	NSF No.	Price
Detailed Statistical Tables, Graduate Science Education: Student Support and Postdoctorals, Fall 1973	74-318-A	----
Reviews of Data on Science Resources, No. 22, "The Federal Role in the Support of Graduate Science and Engineering Education"	74-317	$0.25
Immigrant Scientists and Engineers in the United States. A Study of Characteristics and Attitudes	73-302	$1.25
Price Index for Deflation of Academic R&D Expenditures	72-310	$0.25
Unemployment Rates and Employment Characteristics for Scientists and Engineers, 1971	72-307	$1.75
Scientific Human Resources; Profiles and Issues	72-304	$0.25
1969 & 1980 Science & Engineering Doctorate Supply & Utilization	71-20	$0.50

HIGHLIGHTS

"Federal Scientific and Technical Pe
in 1973"

"Employment of Life Scientists Up in
for Nearly All Growth of Scientists
Doctorate-Granting Institutions"

"1973 Graduate Science Enrollment
Percent"

"Academic R&D Expenditures Up 9 Per

"Immigration of Scientists and Enginee
ly in 1973; Physician Inflow Still Nea

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